

# Are We in Trouble? An exploration on Crime during Natural Disasters and Pandemics

Bisola Ogunro<sup>1</sup>, Amin Hosseinian-Far\*<sup>2</sup>, and Dilshad Sarwar<sup>3</sup>

<sup>1,2,3</sup>Department of Business Systems & Operations, University of Northampton, NN1 5PH, UK

<sup>1</sup> bbogunro@yahoo.com

<sup>2,3</sup>{Amin,Hosseinianfar, Dilshad.Sarwar}@northampton.ac.uk

**Abstract.** The rise of digital business models, social media platforms, and intensified use of cyberspace during the COVID-19 pandemic have inevitably seen respective and associated cyber and cyber-enabled crimes. There has also been fluctuations in other forms of crimes during the pandemic. This chapters provides a critical overview of crime during natural disasters and pandemics. The paper outlines a comprehensive background on pandemics, natural disasters, and crime and attempts to critically review the existing literature on the correlation between these concepts. It then adopts a case study approach to assess the correlation between pandemics and crime using secondary data sources.

## 1. Introduction

At each point in time when there is a pandemic or natural disaster, the way society responds vary from the traditional methods. Oftentimes, survival instinct motivates some individuals to deviate from the traditional, moral, or societal construct of what is right or wrong. This is largely attributable to the enormous effects pandemics, and natural disasters have on daily living, from economic activities, mobility, access to healthcare and social services, interactions, and mental health. Some of these effects are directly traceable to the happenings themselves (pandemic / natural disasters), while

others are traceable to attempts to salvage the situation in case of natural disasters or limit the spread in case of a pandemic.

Pandemics and natural disasters usually have the same side effects, resulting in high morbidity and mortality rates. These kinds of outbreaks often have economic implications on the country of which it is present; the government will be occupied ensuring the health system is upgraded to accommodate the effect of the pandemic, likewise in a natural disaster, the government goes into swift action to defend her citizen's life and property. The citizens as well come up with several coping mechanisms, while others adjust in their ways of living, others rebel against the traditional or societal defined crimes, and some other unconcerned parties take advantage of the situation like selling of fake drugs during a pandemic, ransomware in health institutions, cyber financial crimes, etc.

These draining effects may motivate people to want to result in crimes to make ends meet. Most often than not, pandemics and natural disasters are unplanned, this means the government are usually not prepared for them, and even if prepared, the extent cannot be accurately predicted.

Several authors have worked on the impacts of pandemics on crime and the impacts of natural disasters on crime. Some authors even suggested that the definition of crime should evolve, be open to negotiation, and be continuously evaluated by states (Sandberg and Fondevila, 2020). Many have attempted to understand if the crime rate changed during a health crisis, why it changed, where the most changes occurred, at what point precisely during the pandemic did the shift begin to happen, what type of crime brought the most significant change, and how much change occurred (Ashby's, 2020; Campedelli et al., 2020; Halford et al., 2020; Stickle and Felson, 2020; Abrams, 2021).

Similarly, other authors such as Prelog (2015), Shabu (2017), Roy (2010) have written on the impact, the effect and the relationship of crime and natural disasters. While some viewed it from the perspective of a security concern, others view it from the perspective of coping mechanism, especially in situations where the state is unable to provide necessary relief to victims, and in some cases, it is not the victims that commit the crime, rather others attempting to take advantage of the occurrence. This chapter attempts to identify and compare the impacts of pandemic and natural disasters on crime in the U.K. Pandemics, and Natural disasters restrict movement and increase survival instinct; these could activate a causal mechanism that could either increase or reduce the crime rate as suggested by criminological theory (Eisner and Nivette, 2020). To further delve into this subject, let us take some time to look at the various variables being considered (Pandemics, crime and Natural disaster) and then, subsequently, the relationship between them

Social media has given freedom to anybody with a system and internet connectivity to send information to a great number of individuals worldwide simultaneously with the click of a button. Social media networking platforms help people, organizations, and businesses to connect, promote businesses and are a great source of information however they can leave users exposed to attack. The utilization of social media platforms accompanies significant cybersecurity risks many scams and malicious apps have been developed and have caused severe damages like data breaches, identity theft, phishing, denial of service, password attacks exposing the victims to scammers, hackers, and vulnerable to extortion and fraud. Many individuals and businesses have lost millions to hackers.

## **2. History of Pandemics**

Pandemics are diseases with wide geographic extensions, disease movement that can be traced, high attack rates and explosiveness, minimal population immunity, relatively novel/ new, infectious, and severe (David et al., 2009).

According to the World Health Organization (WHO), a "pandemic is the worldwide spread of a new disease to which most people do not have immunity". Past pandemics have been caused by viruses that originated from animal influenza viruses. Most people confuse pandemics as an epidemic; however, both terms refer to two different things. While a pandemic has been defined as the spread of a new disease, an epidemic is when many more cases of a health condition occur than expected in a particular region but do not spread further.

The WHO has the responsibility to declare when a pandemic is occurring. WHO does this by monitoring the trend of the outbreaks and engaging expert health professionals for advice. The responsibility, however, to control the effect of pandemics lies within the hands of the country's government, most times with external support from other more developed countries or organizations.

## **3. Crime**

Crime is an act that society deems fit as wrong and frankly disallowed by the public (Thotakura, 2011). It is an intentional act that causes psychological or physical harm to a person, leads to property loss, and is contrary to the law. Crime includes Homicides, Gun Assault, Aggravated Assault, Domestic Abuse, Robbery, Burglary, Larceny, Drug usage, Antisocial behaviour, Arson, Childhood Abuse, Cybercrime and Online Fraud, Fraud, Hate Crime, Modern Slavery, Murder or Manslaughter, Rape and Sexual Assault, Sexual Harassment, Stalking and Harassment, Terrorism, Violent

Crime, Theft to mention a few. Most crimes are general across the globe, while some are region-specific.

Henry and Lanier (2001) explained crime as the defilement of societal custom or rule, which is built through the moral constructs of the society; crime is seen to bring harm to individuals, society, or the moral ideals of the society. Therefore, a crime is said to be an act not permissible or allowable in an environment if committed is punishable by laws governing that environment. It is, therefore, an act done either intentionally or without legal justifications that contravenes a criminal law that attracts a predefined punishment (Treadwell, 2013). According to Williams (2021), one out of five persons would be victims of crime at least once in their lifetime. Generally, it is the government's responsibility to provide a formal system and institution to curb crimes, ensure law and order, and set up a system that punishes and brings to book anyone who flaunts the set laws of the environment.

Crimes are classified into various classes since many laws govern daily livings in an environment. Some of the classes include Cybercrime, Organized Crime, White-collar crimes, Sex crimes, Hate Crimes, Violent Crimes, and Property Crimes. Under these classes of crimes, there are several other crimes for ease of reference, and we will discuss these briefly.

#### **4. Natural Disaster**

Natural disasters such as floods, earthquakes, volcanic eruptions, landslides, floods, hurricanes, droughts, tsunamis, tornados, Blizzards, tropical cyclones are natural happenings as the name suggests that overpowers residents limited resources and put the safety, welfare, wellbeing and smooth working and operations of the society at jeopardy and high risk (Gerard, 2002).

According to the United Nations International Strategy for Disaster Reduction (UN-IDSR), a disaster is "a serious disruption of society's functioning, causing widespread human, and material, economic or environmental losses that exceed the capacity of the affected society to cope using only its resources". There are two types of disasters, man-induced and nature-induced disasters. Man-induced disasters are caused by deliberate human actions like terrorism, political unrest, wars. Natural disasters, on the other hand, are disasters associated with natural occurrences (Makwana, 2019).

## **5. Pandemics, Disasters and Crime**

Natural disasters and Pandemics cause fear, anxiety, and panic. The first response to a natural disaster or pandemic is to save lives; security is usually not the top priority in times like that; however, the distraction creates an opportunity for criminals to strike and take advantage of the situation and unsuspecting individuals, corporate organizations, and even government to enrich themselves. During Hurricane Katrina in the U.S., Hackers were busy creating fake donation websites and soliciting funds for disaster relief that were siphoned amidst the various losses (Wallace, 2021). COVID-19 changed the mode of social interactions and economic activities, the lockdown was imposed by most nations, and people had to stay indoors. More people are now compelled to work from home, and many more are spending much time online. Criminology theory suggests that a lockdown can trigger a causal mechanism that either increases or decreases crime; some crimes are likely to increase while others reduce (UNODC, 2020).

Roy (2010) wrote on the effect of natural disasters on crimes, and he concluded that the violent crime rate tends to increase based on the size of the natural disaster. The

conclusions of Roy (2010) contradict the arguments of Paul et al. (1979), they argued that crime rates decrease during a pandemic and do not rise even at the advent of reducing the capacity of policing and other formal security measures because of the usual rise in community-based security and crime management measures. The buildup in the capacity of informal security systems helps curb the rate of criminal activities in the occurrence of a natural disaster by making the cost and risk of committing crime too high.

A widespread reduction in crime rate followed the earthquake that crushed Chile in 2010 in the property crime rate; García (2019) reported that the effects of the earthquake triggered the robust community support that included community tactics of curbing crimes. These results obtained by García (2019) contradict the arguments of the routine activities theory. The routine activities theory states that the rise in the number of susceptible targets and decrease in the capability of security measures leads to an increase in the crime rate after a natural disaster (Cohen and Felson, 1979). The cost of perpetuating crime significantly reduces because of reduced policing and other security measures, as most attention is on rescuing victims, building IDP (Internally Displaced People) camps, and settling victims in a secured environment.

Conversely, other studies have also reported a decrease in different types of crimes after a pandemic, such as. Paul et al. (1979) reported a significant reduction in the crime rate following Florida's hurricane Andrew. Leitner and Helbich (2011), Sammy et al. (2009), and Bailey (2009) all reported a drop in violent and property crime following the natural disaster that was studied in various cities. However, Sammy et al. (2009) also reported an increase in violent crime rate, particularly domestic violence. Similarly, even though Bailey (2009) and Leitner and Helbich (2011) reported reductions in the rate of property crimes generally, they both reported a rise in

burglaries. This suggests that crime rate increment or reduction during a natural disaster is not homogeneous but rather heterogeneous; while the rate of some crimes increases, the rate of some decreases, and this all depends on the several prevailing conditions and the events that follow the occurrence of the natural disaster.

Many reports were presented in the light of the increment and reduction of crime rate related to natural disasters; however, Renee et al. 2017 reported a displacement of property crime from the areas affected by flooding in Brisbane, Australia, to areas that were not affected when exploring the effect of the January 2011 floods in Brisbane neighbourhood. Another case of displacement of crime was reported by Breetzke and Andresen (2018), following the 2010 and 2011 earthquakes in New Zealand; they reported that the rate of crime dropped in the Central Business District in Christchurch that was affected by the earthquakes and a rise was recorded in the central business district neighbours that were not affected or less affected by the earthquakes. This implies a displacement or flight of crime from one location to another.

This suggests that how crime rates in communities respond to natural disasters differs and is non-linear in rising or reducing but can also be a displacement or perhaps total flight away from a region.

## **6. Crime during Pandemic and Natural disaster**

Many studies have written on the various effects of COVID-19 and crime rate; however, it is not extensive because we are still grappling with the effects of the pandemic as new variants keep springing up.

McDonald and Balkin (2020) reported the crime rate in four U.S. cities comparing it to the previous year, and some others restricted their study to certain jurisdictions like Los Angeles, US (Campedeilli et al.,2020), Australia (Payne et al.,



2020) and Lancashire in the U.K. (Halford et al. 2020). These studies are limited in coverage, and it reported declines from minimal to significant in various types of crime across the states covered. Halford et al. (2020) discovered a decrease in non-residential burglary, while Abrams (2021) observed a substantial increase.

Ashby's (2020) study was based on crime variation in 16 U.S. cities within the first two months of the pandemic compared to historical data; the result was that the divergence was not statistically significant. According to Abrams (2021), there was a considerably more significant divergence in the crime rate. This might be due to the availability of more data.

In a report on Pandemic, Social Unrest, and Crime in U.S. Cities by Rosenfeld et al. (2020), the study was carried out in 34 U.S. cities. In the report homicides rate increased by 30%, aggravated assault increased by 6%, gun assault increased by 8%, car theft increased by 13%, Robbery rate decreased by 9%, the rate of residential burglary reduced by 24%, and non-residential by 7%, drug use reduced by 30%, larceny decreased by 16%, and it was also significant increase was also reported in the rate of domestic violence in the early years of the pandemic in 2020 compared to 2019. The report revealed a consistent increase in violent crimes (homicides, gun assault, aggravated assault, domestic violence) and a decrease in the rate of non-violent crimes (Robbery, burglary, larceny, and drug usage). The report of Rosenfeld et al. (2021) is consistent with the findings of Halford et al. (2020).

The decrease in non-violent crimes during the COVID-19 pandemics in 2020 reported by Halford et al. (2020) and Rosenfeld et al. (2020) are consistent with the global 50% decrease reported by UNODC (2020), especially in countries with stricter lockdown policies. It is fair to attribute the decrease in non-violent crimes such as theft, burglary, drug usage and robbery, to the lockdown and social distancing that ensued

after the pandemic. With violent crimes (specific focus on Intentional Homicide), UNODC (2020) reported variations in the report from various countries. Suggestively, the variations were attributed to variances in the strictness of the lockdown measures placed by the government of the various countries, the high proportion or prevalence of a particular type of homicide in existence before such as gang clashes and organized crimes, in the various countries and also the socioeconomic state of the countries pre-pandemic.

Contrarily, Yang et al. (2021), in their study of the impact COVID-19 has on crime, examined criminal damage, robbery, assault, burglary, battery, fraud, and theft. They reported an overall significant decrease in the crime rate in Chicago, especially with burglary: both residential and non-residential, battery, fraud, and theft. Again, this can be attributed to the quarantine that restricted the movement of people during the pandemic. Some crimes became factually impossible, especially during the lockdown, making it less probable to commit crimes, e.g., theft. Because of the decrease in legal activities, very few individuals were often out in the heat of the COVID-19 pandemic, and this increased the difficulty of perpetuating some crimes and made it easier for law enforcement to record more of certain crimes.

A decrease in some activities easily explains the decrease in some criminal activities such as theft; for example, Jahshan (2020) reported an 85% reduction in traffic for physical retail shops in the U.S. during the pandemic, and this is consistent with reports of fewer thefts such as shoplifting, robbery. The submission of Jahshan (2020) is consistent with the report of Pietrawska et al. (2020) on the significant 24% drop in the rate of shoplifting in Los Angeles. Another example is the 61% reduction in the pocket-picking type of theft in a city in the U.K. during the heat of the COVID-19 pandemic as a result of the social distancing directives (Gerell et al., 2020).

However, as highlighted by Campedelli et al. (2021) that crimes and or certain crimes are usually frequent in some neighbourhoods as opposed to being distributed randomly in a city, Yang et al. (2021) observed the cluster of battery, burglary, fraud, and theft in some areas of Chicago. Yang et al. (2021) also reported patterns in the occurrence of battery, theft, assault, and fraud. They also reported an inclination of sensitivity of crimes to events (pandemic related or not) and policies. One key feature that impacts crime during pandemics and natural disasters is the disruption of daily routines that follow movement restrictions and or complete lockdown directives.

BAE Systems (2021) surveyed the COVID-19 crime index and reported that 74% of financial institutions increased fraudulent activities during the pandemic, with a mean increase of 29% in fraudulent activity. 51% of the financial institutions surveyed had to upgrade their security firewalls because of remote working, which was a long time-consuming process to hedge against fraudulent activities. Furthermore, 74% of the financial institutions surveyed were disturbed over the increase in cyber-criminal activities relating to the pandemic, while 77% of them were much more disturbed over the predicted rise in the cyber threats for the succeeding year(s). The results obtained open a perspective of institution-related and institution-affected criminal activity. During a pandemic or a natural disaster, not only individuals are affected by the crimes that are being perpetuated, institutions (financial, medical, manufacturing, and pharmaceutical) are also affected by criminal activities.

However, individuals are unavoidably affected by criminal activities that affect institutions. BAE Systems (2021) reports that 3 out of 4 end-users of the financial institution surveyed have observed malicious or fraudulent activities in the previous year, and 1 out of 4 end-users are now more scared of cyber fraud than non-cyber fraud. 50% of their end-users have been sufferers of online crime at one time, and 10 out of

50 have experienced online crime in the previous year. The impact of cyber-crime, whether during a pandemic or natural disaster, transcends institutions and individuals to states.

During the 2020 COVID-19 pandemic, cybercrimes and violent crimes (homicides, gun assault, aggravated assault, and domestic violence) were perpetuated the most. The most probable causes for this will be the economic hardships that follow the occurrence of a pandemic or natural disaster. Organized criminal activities that have been in existence before the pandemic or natural disaster used the rather tragic events as opportunities to perpetuate more crime. Criminal activities that have been happening before, such as gang violence, were aggravated by the psychological trauma of having everything grounded, especially during the lockdown, human trafficking victims, especially those in confinement by their traffickers and those in domestic servitude. (UNODC, 2020; BAE systems, 2021; Campedelli et al., 2021). Similarly, because of the lockdown directives and social distancing that required people to stay at home and work remotely, people now spend more time online than offline, increasing their chances of being targeted for cyber-crimes.

Andresen and Hodgkinson (2020) examined crime patterns during the 2020 COVID-19 pandemic in Queensland, Australia, and revealed that the rate of crime generally reduced when the total lockdown restriction was enacted and increased as restrictions were relaxed into social distancing. During the initial total lockdown, more people were inside, leaving less of a target for perpetrators of crime. Also, the total lockdown restriction made policing easier for formal institutions that were established to curb crime. Similarly, Felson et al. (2020) reported a drop in the crime rate in Detroit during the first few periods of the social restriction; their study reported a significant drop in the rate of residential burglary, which eventually began to increase as the

restriction was relaxed. Also, up to a 60% rise was recorded in the rate of crime in China at the initial stage of the enacted social restriction, which eventually rose higher than the initial levels before the drop when the enacted restrictions were relaxed (Borrion et al., 2020).

## **7. Theoretical Concept**

### **7.1 The Fraud Triangle**

The fraud triangle was developed by Donald Cressey when he interviewed over 200 embezzlers for his PhD program in 1953. The fraud triangle was initially a hypothesis of Donald's work. It was targeted at financial crime, especially with individuals that have been trusted around finances and ended up violating the trust because of the pressure of a need that was perceived to be un-shareable to anyone else, hence unsolvable by anyone else.

Donald Cressey's Fraud Triangle identifies opportunity as one of the three factors required to perpetrate fraud. Pressure, rationalization, and opportunity are the three legs of the fraud triangle, which states that these three things must have been in place for fraud to occur. During a pandemic and natural disaster, these three factors are present.

#### **i. *Pressure***

Pressure also refers to the motive for perpetrating fraud. Pressure is best described as perceived because it can be real or unreal (Albrecht et al., 2008). Sources of pressure could be social standing, financial, political, non-political, religious belief and examples can vary from health, debt, maintenance of standard of living, family, and more (Murdock 2008, Abdullahi and Mansor, 2015). For every time that fraud is committed, there must be an incentive or motive or pressure that would fuel the heat for the fraud to be committed. The pressure can be financial or non-financial. Lister

(2007) stated that pressure could come externally or as a result of occupational stress or personal; this is fairly consistent with the submission of Albrecht et al. (2008) that pressure can fall into one of the four categories of money related, addiction, employment-related and miscellaneous pressures. Donald Cressey (1953), as described by Kassem and Higson (2017), categorized the perceived pressures that fraud perpetrators consider unshareable and eventually lead to committing fraud into 6 (six) groups, viz:

1. Inability to fulfil debt obligations.
2. Inability to take care of personal responsibilities.
3. Bad business, unforeseen losses in business that are beyond control. It could be due to macro-economic or micro-economic factors.
4. Lack of access to help. When the fraud perpetrator cannot access people who can help them out of the difficulty they found themselves in.
5. Social or political standing, the standard of living that is above the fraud perpetrator's means.
6. An unhealthy relationship with employer, co-employees, or subordinates.

However, when it comes to crime and natural disasters, there are still motives, pressure, or incentives for committing a crime which may not exactly fall under some of the categories relating to Donald's Fraud triangle theory. The pandemic or natural disaster comes with its economic hardship and scarcity of resources for both individuals and the government of affected countries, which is a form of pressure (UNODC, 2020).

ii. ***Opportunity***

According to Cressey (1953), if the risk of being caught is low, the fraud will most likely occur, which can mean that there must be a chance of getting away with it. Opportunity is highly crucial for fraud to occur. During the pandemic of 2020 (COVID-

19), many studies reported a drop in the rate of certain crimes such as robbery, burglary, larceny, and drug usage (Halford et al. 2020; Rosenfeld et al., 2020; Yang et al. 2021). This is easily explained as a drop-in opportunity resulting from the drop in some activities such as strict lockdown and social distancing policies. Drop-in activities lead to drop-in opportunities. Also, because of the lockdown and social distancing policies, fewer people were active, making policing easier and increasing the risk of getting caught.

However, for some other crimes during the pandemic (COVID-19), especially crimes that can be committed indoors or in isolation, such as homicides, gun assault, aggravated assault, domestic violence, cyber fraud, and gang violence, many studies reported a rise in the rate of these crimes (UNODC 2020; BAE systems, 2021; Campedelli et al., 2021).

It could be deduced that during a pandemic or natural disaster, opportunities for some crimes increase while opportunities for other crimes decreases depending on the measures that the state adopts to either cushion the effect or flatten the curve of the disaster or pandemic.

Simply put, an opportunity is a possibility of finding a way around crime control (Wilson, 2007).

### iii. ***Rationalization***

Rationalization is the bridge that connects pressure/ motivation to opportunity (Howe and Malawi, 2006). It is the third leg that completes the triad of the fraud triangle. Once the fraudulent action can be rationalized, then the probability of committing fraud is very high. During a pandemic or natural disaster, as with any other time, and as with most actions of humans, there has to be a rationalization for the action that is being perpetuated. If the perpetrator of the crime could not rationalize it, then

there is a lesser chance of perpetuating the crime. Rae and Subramanian (2008) described rationalization as the explanation of committing a crime or validation of a crime that is about to be committed or that has been committed.

During crises such as natural disasters, pandemics/ endemics, people have many reasons that can be used to justify their actions such as survival or coping mechanism during to the economic hardships that usually follows the crises. This is probably one of the reasons why most governments provide palliatives and bailout funds for both individuals and organizations. These government efforts help to take care of economic/ financial justification/rationalization and pressure for committing a crime or at the very least cushion the effect.

## **7.2 Economic Theory of Crime**

Like the fraud triangle, the economic theory of crime explores how the perpetrator of crime justifies committing a crime. The economic theory of crime is traceable to Becker (1968). The economic theory of crime explained that an "individual committed a crime if the expected benefit acquired from committing the crime outweighs the benefits acquired from engaging in a legal, economic activity (Becker, 1968; Pyle, 1983; Roy, 2010).

According to Anupama (2011), individuals who perpetrate crime assume that returns from legitimate work are without risk and small compared with the benefits of committing a crime. Therefore, crime is perpetuated with the motive of exploiting or taking full/ complete advantage of a situation and when the perceived outcome outweighs legitimate work. Crime is also perpetuated when the perceived outcome far outweighs the known punishment for committing the crime.

## **7.3 Routine Activity Criminal Theory**



The crime rate is often influenced by the lifestyle and behaviour of the population (Cohen and Felson, 1979); for example, there would be no cybercrime if there were no computers and the internet. The routine activity theory is one of the major theories of environmental criminology. It states that there is a possibility for a crime to be committed when there is a motivated perpetrator, accessible target, and the simultaneous absence of a capable guardian that could prevent crime (Arelis and Bonnie, 2012). The routine activity theory examines crime from the perspective of an offender. The motivated offender will only commit a crime if they feel it is relatively safe and how they feel it is relatively safe is through the availability of a suitable target in the absence of a capable guardian.

An accessible target, also referred to as a suitable target, can be a person, place, or thing. The capable guardian is usually a human element or anything whose presence can prevent the occurrence of crime. A capable guardian can be a police officer, neighbours, vigilantes, CCTV camera, security dogs, staff, friends, security guards. A capable guardian might be formal or informal; it might also be effective and non-effective. An example of an ineffective guardian is a neighbour who is not paying attention, CCTV in the wrong direction, and a co-worker who is not trained to detect crime or even stop it. A motivated offender is a perpetrator who sees or looks out for an opportunity to commit a crime. During a crisis, there is often a change in daily routines, lifestyle, and behaviour of people, which either creates or eliminates opportunities for creating crimes.

## **8 Methodology and Findings**

This study was conducted through the lens of critical realism. The ideal of critical realism is appropriate for the thorough analysis of historical trends. This study

is not carrying out any experiment; instead, it views how the crime rate has been influenced by pandemics and natural disasters retrospectively. Secondary quantitative data is collected to investigate causal mechanisms of the data obtained and the inherent consequences of both pandemic and natural disasters on the crime rate in the United Kingdom. The axiological structure of critical realism resonates with this study.

The study strategy adopted for this study is the Case Study strategy. A case study is carried out by collecting either qualitative or quantitative information or both on the subject matter to be investigated with a particular set of the population (Bryman & Bell, 2011). In this study, the United Kingdom is the population that is being used as a case study. The study investigates how the crime rate is affected by pandemics and natural disasters in the United Kingdom. The study design for this study is an inductive case study.

This study makes use of the mono method. All data collected were collected secondarily and in a quantitative format.

Appropriate, proper, and accurate data analysis alongside proper data collection techniques ensures the integrity of data. The data collected for this study is primarily quantitative and were analyzed quantitatively using a two-tailed paired t-test and graphical representations to arrive at logical conclusions.

The data is obtained from the public domain of the Office for National Statistics and were summarized into annual averages for three years.

- i. Year 2017 represents a period of Natural disaster. 2017 witnessed Hurricane Ophelia. Hurricane Ophelia was estimated to have caused over \$1.8 billion in damages and was the worst storm to be witnessed in the United Kingdom in the last 50 years. Hurricane Ophelia caused much economic disability

following its incidence, and economic instability is one of the motivators or justification for crime, as discussed in the previous chapter.

- ii. Year 2019 represents a reasonably neutral year. The year witnessed no natural disaster except for the United Kingdom floods that started in November towards the end of the year and ended in February 2020.

Year 2020 represents the pandemic year, which witnessed the COVID-19 pandemic, and is still ravaging the globe. In an attempt to curb the spread of the pandemic in 2020, multiple total lockdown protocols were initiated. Economic activities were grounded, and the way some businesses were conducted changed, which left many in a poor economic state.

### **8.1 Method of Data Analysis**

The data on crimes from these three years were obtained from the UK Office for National Statistics website and summarized into annual averages. The categories of crimes that were considered are violent crimes, sexual offences, robbery, theft, criminal damage and arson, drug offences, possession of weapons, public order offences, crimes against society (others), and fraud. The annual averages of these crimes in both the pandemic and the natural disaster year were matched against the neutral year individually, and a student t-test were conducted to know if there is a significant difference in crime rate between those years and the neutral year.

The T-test was used to test the significance of differences among two variables. In this study, the paired t-test was adopted because of the association between the data over the years and across different occurrences of either pandemic or natural disaster. The paired two-tailed t-test helped to understand if there is any significant difference in crime between a pandemic/ natural disaster year and a normal year. The significant

difference is irrespective of the increase or decrease in crime rate in a pandemic/ natural disaster year with a typical year.

The calculated averages were also compared pictorially via graphs across all crime categories to observe the differences between the years if the crimes were higher or lower compared to the neutral year. The graphs would help identify crime categories with an increase or decrease in the pandemic/ natural disaster year compared to a typical year.

The crime rate was recorded as per 1000 of the population. Year 2017 represented the year for natural disaster because of the occurrence of Hurricane Ophelia, which dealt the most significant impact in recent time. There were not many things unusual about 2019; therefore, 2019 was referenced as a normal year. COVID-19 was declared a pandemic by WHO in March 2020. The COVID-19 virus highly impacted 2020 and therefore represented a pandemic-stricken year. Year 2018 was omitted because the impact of the natural disaster was far less than that of 2017.

The overall result of this analysis is in tandem with the position of Paul et al. (1995), who argued that crime rates decrease during a pandemic. They continued to argue that the crime rate does not rise even at the advent of the reduction of the capacity of policing and other formal security measures because of the usual rise in community-based security and crime management measures; however, the scope of this study is limited and cannot ascertain if it agrees further with this claim.

A common need during a crisis is survival, which is sought for in different ways and some ways can be perceived as an opportunity to commit a crime, consistent with the second factor in the Fraud Triangle Theory (Cressey, 1953). The need for survival was lightened through government support for individuals and businesses when the lockdown measures were enacted in the wave of the pandemic. The government support

came through grants and loans; this deflated the pressure of taking care of the essential needs of man. The government support aided in reducing the motivations to commit potential crimes, hence the reduction in the rate of certain crimes recorded in this study.

The significant difference in the rate of violent crime between the years 2017 (natural disaster) and 2019 (normal) seems not to be attributable to the natural disaster as the levels were consistently higher throughout 2019 (normal period) than 2017 (natural disaster) when compared.

We do not have sufficient evidence to attribute the significant difference recorded in the rate of burglary between the natural disaster periods and normal periods because the rate of burglary seems to be higher all year 2017 when placed side by side with 2019. This is hard to pin on the natural disaster (Hurricane Ophelia) that did not occur until October 2017.

The significant all year low in the rate of burglary in 2020, when compared to 2019, can be easily attributed to the COVID-19 pandemic that impacted the globe for the entirety of 2020 and whose consequence was the placement of the U.K under some form of lockdown (partial and total) throughout 2020. As a result of the restriction, most individuals were indoors, and the ratio of law enforcement officers to people present in public spaces increased, making it difficult to perpetrate crime. The result agrees with the findings of Halford et al. (2020) on the decrease of non-residential burglary during a pandemic. Also, Rosenfeld et al. (2020) reported a 24% reduction in residential burglary and a 7% reduction in non-residential burglary in 34 cities in the United States of America during the pandemic. Generally, Rosenfeld et al. (2021) and Halford et al. (2020) reported a reduction in non-violent crime.

Furthermore, these are consistent with the global 50% decrease reported by UNODC (2020), especially in countries with stricter lockdown policies. Similarly,

Yang et al. (2021), in their study of the impact that COVID-19 has on crime, examined criminal damage, robbery, assault, burglary, battery, fraud, and theft. They reported an overall significant decrease in the crime rate in Chicago, especially with burglary: both residential and non-residential, battery, fraud, and theft. Again, this can be attributed to the quarantine that restricted the movement of people during the pandemic. Some crimes became factually impossible, especially during the lockdown, making it less probable to commit crimes like theft. Because of the decrease in legal activities, very few individuals were often out in the heat of the COVID-19 pandemic, and this increased the difficulty of perpetuating some crimes and made it easier for law enforcement to record more of some certain crimes.

Similarly, Felson et al. (2020) reported a drop in the crime rate in Detroit during the first few periods of the social restriction; their study reported a significant drop in the rate of residential burglary, which eventually began to increase as the restriction was relaxed.

Also, the significant all year low in the rate of theft in 2020, when compared to 2019, can be easily attributed to the COVID-19 pandemic that impacted the globe for the entirety of 2020. The same case can be argued for theft as with burglary above. In addition, knowing full well that it is a pandemic and COVID-19 is communicable, and the virus can be easily contracted by touching anything infected and subsequently ingesting it via the nose and mouth; the fear of contracting the virus might have also detracted the perpetrator of the crime from breaking the lockdown restriction and consequently committing the crime. This agrees with the submission of Pietrawska et al. (2020) on the significant 24% drop in the rate of shoplifting in Los Angeles. Similarly, Gerell et al. reported a 61% reduction in the pocket-picking type of theft in

a city in the U.K during the heat of the COVID-19 pandemic due to the social distancing directives.

It is difficult to pin the significant difference in the rate of drug offence on natural disasters (Hurricane Ophelia) because the rate of drug offences was low all year round 2017 when compared to 2019, and we do not have sufficient data to determine what happened in the parts of 2017 when the natural disaster had not occurred.

The significant difference in the rate of other crimes between 2017 and 2019 cannot be attributed to a natural disaster (Hurricane Ophelia) because the rate was low all year round 2017 compared to 2019, while the hurricane and its impacts were between October and December of the same year. We do not have enough data to analyze and evaluate what was responsible for all year significant difference in the rate.

Similarly, the significant increase in the rate of fraud offences between 2017 and 2019 cannot be attributed to the natural disaster (Hurricane Ophelia); the same case can be argued as with 'other crimes' above.

To gain further clarity and insights on the aspects of the natural disaster where we did not have enough data to arrive at a concrete conclusion, the last quarter of 2017 was compared with the last quarter of 2019. The differences in the rate of crime in the period of a natural disaster compared with the same period during a normal year are not significant and can just be attributed to chance.

	<b>Crime Per 1000;</b>	
	<b>October - December</b>	
	2017	2019
Homicide	163	212
Violent Crime	353605	423290

Rape	13438	13683
Sexual	24213	23634
Robbery	20845	21829
Burglary	114904	92020
Theft	395460	362574
Criminal damage and arson	152805	134214
Drug offences	35014	43623
Other Crimes	127432	138818
Fraud Offences	150893	183779
Average	126252	130698
P-value =	0.61	

*Table 1 – Crime rate During Natural Disaster*

The average crime rate in the examined period also seems less during the natural disaster than in the normal period (Table 1). Also, this might be because data obtained in this study is not specific to areas most affected by the natural disaster but applies to the whole of the U.K during the pandemic. Many studies by Roy (2010), Paul et al. (1979), Leitner and Helbich (2011), Harper & Frailing (2012), Quarantelli (2007), Kwanga et al. (2017) have reported the increase in the rate of crime during a natural disaster.

The low rate of significant difference in crime rates recorded in this study can be attributed to the deviation in the normal routines during normal periods. Much more attention is paid during a crisis than during normal periods. The Routines activity criminal theory supports this claim. The Routine activity criminal theory developed by



Cohen and Felson (1979) established that three factors make crime possible: a motivated perpetrator, a suitable victim and the absence of a competent watch. In a crisis, at least one of the factors is not available for crime to occur. The routines of the suitable victims change, making them unsuitable. Also, there is increased attention by law enforcement and local vigilantes, causing a spike in law enforcement people density in affected areas in the case of natural disasters and public spaces in case of pandemics.

## **8.2 Summary of findings**

Crises generally lead to disruptions in routines, non-use or redefined use of public space, and affects social interactions. These potential changes in daily living create opportunities for some crimes and block or reduce chances for other crimes. As much as there was no significant difference in the rate of crime during a pandemic and natural disaster in the United Kingdom from the normal time, the study revealed conclusively that the rate of theft and burglary decreased in the United Kingdom during the pandemic.

However, the results were still inconclusive despite significant results obtained for violent crimes, burglary, drug offences, other crimes against society, and fraud offences during the year representing natural disaster. This is because of the presence/continuation of a trend that either increases or decreases during that pre-natural disaster, making it unclear to attribute the difference to the natural disaster or other factors. Other crime categories during the natural disaster period showed no significant difference from normal periods. Besides from theft and burglary, other crime categories showed no significant difference during the pandemic.

Balmori et al. (2021) observed a 'U' shaped pattern; pre-pandemic, during pandemic and post-pandemic, in how crime rates, including theft, were affected by the COVID-19 pandemic in Mexico. They observed that crime rates dropped during the

lockdown and raised back-up after the restrictions were relaxed. Balmori et al. (2021) attributed some of the rises after the lockdown was relaxed to the resultant job loss and economic hardships that ensued with the lockdown restriction. This claim is supported by past studies (Raphael & Winter-Ebmer, 2001) on how unemployment increases the crime rate. The drop-in crime was attributed to the reduction in opportunities to commit a crime according to the routine activity criminal theory and the fear of getting infected especially relating to crimes that are committed in groups. The UNODC (2021) reported a more than 50% decline in theft and burglary crime across the globe. This was attributed to an actual decrease in crime and a possible reduction in reported cases.

David (2021) also reported a drop in the crime rate in the USA, with a 24% decline in residential burglary. However, he reported a rise in commercial burglary and car theft, a 38% increase in commercial burglary and a more than 2.5-time rise in car theft. The increase in commercial burglary is possibly attributable to the reduction in concentrated activities around commercial properties, making them an easy target. Car theft might also be attributable to less mobility which meant that people left their cars parked outside untouched for extended periods.

Nivette (2021), in their study of 27 cities spread wide across 23 countries, found out that the rate of robbery (which includes theft) did not significantly increase statistically during the pandemic. However, they recorded an 84% reduction in the burglary rate in Lima (the highest decline they recorded). On average, a 28% reduction was recorded in burglary across all cities study after enforcing the social restriction.

Similarly, Scott (2021) compared the early periods (January to April 4) of COVID-19 pandemic in Chicago, Baltimore, and Baton Rouge in 2020 to the same period in 2019, 2018, and 2017 and found out that for each of the other years, there was

a decline in the rate of total crime with theft and burglary common across all comparison.

David (2020) examined the crime rate in 25 large US cities during the pandemic and reported an average of 23% decline in the overall crime rate with a massive drop in the rate of theft and burglary.

## **Conclusion**

Pandemics, Crises, and natural disasters are often unplanned; when they happen, they throw society off balance economically, socially, psychologically. Countries respond differently, and so do individuals. Some resort to crime either for survival or to continue to maintain a certain standard of living as before the crises. Others perpetuate crime to take advantage of the situation, whichever relates. The Pandemics, Crisis, and natural disasters create pressure to commit a crime; other factors, including how the government/ state responds to the crises, either providing or eliminating opportunities that individuals rationalize it in their minds. While not all crimes increase during a pandemic, some increase while others reduce, some factors that may influence the type of crime that increases or reduces are region/ location, governmental pro-activeness

A common factor responsible for the drop in the rate of crime, especially theft and burglary during the pandemic, was a reduction in opportunity according to the routine activity criminal theory, all traceable to a high reduction in population mobility. Generally, many previous studies recorded a decline in the rate of property crime (which includes theft and burglary) as found in this study.

This study and its outcome can be useful to crime agencies to properly guard themselves and the society they protect. Government agencies can also use the outcome to shape government policies and equally help in damage control.

## References

- Abdullahi. R, Mansor. N (2015). 'Fraud Triangle Theory and Fraud Diamond Theory. Understanding the Convergent and Divergent For Future Research. International Journal of Academic Research in Accounting, Finance and Management Sciences Vol.5, No.4, October 2015, pp.38-45.
- Abrams, D.S. (2021). COVID-19 and crime: An early empirical look. *Journal of Public Economics*, [online] 194, p.104344. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7826063/pdf/main.pdf> [Accessed 27 June 2021].
- Abrams, David S., (2020), COVID-19 and Crime: An Early Empirical Look. U of Penn, Inst for Law & Econ Research Paper No. 20-49, Available at SSRN: <https://ssrn.com/abstract=3674032> or <http://dx.doi.org/10.2139/ssrn.3674032>
- Albrecht, W. S., Albrecht, C. & Albrecht, C. C. (2008). Current Trends in Fraud and its Detection: A Global Perspective. *Information Security Journal* Vol.17. Retrieved from [www.ebscohost.com](http://www.ebscohost.com) on 11th August 2021.
- Andresen and Hodgkinson (2020), "Somehow I always end up alone: COVID-19-19, social isolation and crime in Queensland, Australia". *Crime Science*, Springer's Nature. <https://doi.org/10.1186/s40163-020-00135-4>.
- Anupama Jacob (2011), 'Economic Theories of Crime and Delinquency'.
- Arelys, Madero-Hernandez and Bonnie, S. Fisher (2012), Routine Activity Theory. *The Oxford Handbook of Criminological Theory*. DOI: 10.1093/oxfordhb/9780199747238.013.0027 Available online.

<https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199747238.001.0001/oxfordhb-9780199747238-e-27>

Ashby P.J. (2020). Initial evidence on the relationship between the Coronavirus pandemic and crime in the United States.

Athena Kolbe & Hutson, Royce & Shannon, Harry & Trzcinski, Eileen & Miles, Bart & Levitz, Naomi & Puccio, Marie & James, Leah & Noel, Jean & Muggah, Robert. (2010). Mortality, Crime and Access to Basic Needs Before and After the Haiti Earthquake: A Random Survey of Port-au-Prince Households. *Medicine, conflict, and survival*. 26. 281-97. 10.1080/13623699.2010.535279.

BAE Systems (2021), The COVID-19 Crime Index 2021, Online, Opportunistic and Over-powering.

Bailey. K (2009). An evaluation of the impact of hurricane katrina on crime in New Orleans, Louisiana. Technical report, Unpublished Applied Research Project for a Master of Public Administration, Department of Political Science, Texas State University.

Balmori de la Miyar, J.R., Hoehn-Velasco, L. & Silverio-Murillo, A. (2021), The U-shaped crime recovery during COVID-19: evidence from national crime rates in Mexico. *Crime Science*, 10(1).  
<https://doi.org/10.1186/s40163-021-00147-8>.

Becker, G.S. (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, [online] 76(2), pp.169–217. Available at:  
<https://www.jstor.org/stable/1830482>.

Borrion, H., Kurland, J., Tilley, N., & Chen, P. (2020). Measuring the resilience of criminogenic ecosystems to global disruption: A case-

study of COVID-19 in China. PLoS ONE. <https://doi.org/10.20944/preprints202006.0309.v1>.

Breetzke, Gregory & Andresen, Martin. (2018). The spatial stability of alcohol outlets and crime in post-disaster Christchurch, New Zealand: Alcohol and crime in post-disaster Christchurch. *New Zealand Geographer*. 74. 10.1111/nzg.12182.

Bryman, A., & Bell, E. (2011) 'Business Research Methods', (3rd ed.) Oxford: Oxford University Press.

Campedelli, G.M.; D'orsogna, M.R. (2021), Temporal Clustering Of Disorder Events During The COVID-19 Pandemic. Arxiv**2021**, Arxiv:2101.06458.

Campedelli, Gian Maria, Aziani, Alberto, Favarin, Serena, (2020). Exploring the Effect of 2019-NCoV Containment Policies on Crime: The Case of Los Angeles, 1–49. <https://doi.org/10.31219/osf.io/gcpq8>.

Cohen, L.E. and Felson, M. (1979). Social Change and Crime Rate Trends: A Routine Activity Approach. *American Sociological Review*, [online] 44(4), pp.588–608. Available at: <https://www.jstor.org/stable/2094589?seq=1>.

Cressey, D. R. (1953). *Other People's Money*. Montclair, NJ: Patterson Smith, pp.1-300.

David M, Gregory K, and Anthony S (2009), "What is a Pandemic". *The Journal of Infectious Diseases*.

David S. Abrams (2021), *Crime in the Time of COVID-19*. The EconoFact Network

Eisner, M. and Nivette, A. (2020). *HFG RESEARCH AND POLICY IN BRIEF Violence and the Pandemic Urgent Questions for Research*. [online] .

Available at:

<https://static1.squarespace.com/static/5b293370ec4eb7e463c960e6/t/601d605dfa7dbf24f5aef487/1612537950607/Violence+and+the+Pandemic.pdf>.

Eric Halford, Anthony Dixon, Graham Farrell, Nicolas Malleson, Nick Tilley (2020) Crime and coronavirus: social distancing, lockdown, and the mobility elasticity of crime SocArXiv Papers (2020), pp. 1-22.

Felson, M., Jiang, S., & Xu, Y. (2020). Routine activity effects of the COVID-19 pandemic on burglary in Detroit, March 2020. *Crime Science*, 9, 1–7.

García Hombrados, J. (2019), The lasting effects of natural disasters on property crime: Evidence from the 2010 Chilean Earthquake, Social Policy Working Paper 12-19, London: LSE Department of Social Policy.

Gerard March (2002), “Natural Disasters and the impact on Health”. The University of West Ontario.

Gerell, M., Kardell, J., & Kindgren, J. (2020). Minor COVID-19 association with a crime in Sweden, a five-week follow-up. Malmö University <https://osf.io/preprints/socarxiv/w7gka/>.

Harper, D. W., & Frailing, K. (2012). *Crime and criminal justice in disaster*. Durham, NC: Carolina University Press.



- Henry, S and Lanier, M (2001). “What is Crime? Controversies over the Nature of Crime and What to do about it. 10.2307/3089445.
- Howe, M. A. and Malawi, C. A. (2006) Playing the ponies: A \$ 5 million embezzlement case. *Journal of Education for Business* 82 (1): 27 – 33.
- Jahshan, E. (2020). Retail footfall declines at sharpest rate in March. Retail Gazette: <https://www.retailgazette.co.uk/blog/2020/04/retail-footfall-declines-at-sharpest-rate-in-march/>
- Kassem, R, and Higson, A (2017), ‘The New Fraud Triangle’. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)* 3(3): 191-195.
- Kwanga, G. M., Shabu, T., & Adaaku, E. M. (2017). Natural disasters and crime incidence: A case of 2012 flooding in Benue State, Nigeria. *International Journal of Geology, Agriculture and Environmental Sciences*, 5(5), 43–48.
- Lister, L. M. (2007). *A Practical Approach to Fraud Risk: Internal Auditors*.
- Leitner, Michael, and Marco Helbich (2011). “The Impact of Hurricanes on Crime: A Spatio-Temporal Analysis in the City of Houston, Texas.” *Cartography and Geographic Information Science*, vol. 38, no. 2, Jan. 2011, pp. 213–221, 10.1559/15230406382213
- Makwana, N. (2019). Disaster and its impact on mental health: A narrative review. *Journal of Family Medicine and Primary Care*, [online] 8(10), pp.3090–3095. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6857396/>.
- Maryville University (2020). *The Main Types of Crimes: Motivations and Crime Protection*. [online] Maryville Online. Available at:

<https://online.maryville.edu/blog/types-of-crimes/#:~:text=Understanding%20the%20Main%20Types%20of%20Crimes%3A%20Motivations%20and>

McDonald, John F., Balkin, Steven, (2020). The COVID-19 Virus and the Decline in Crime. <https://ssrn.com/abstract=3567500>.

Murdock, H. (2008). The Three Dimensions of Fraud: Internal Auditors. Retrieved on June 22, 2014, from [www.emerald.com](http://www.emerald.com).

Nivette, A.E., Zahnw, R., Aguilar, R. (2021), A global analysis of the impact of COVID-19 stay-at-home restrictions on crime. *Nat Hum Behav* **5**, 868–877 (2021). <https://doi.org/10.1038/s41562-021-01139-z>

Paul Friesema, James Caporaso, Gerald Goldstein, Robert Lineberry, and Richard McCleary (1979). *Aftermath: communities after natural disasters*. Beverly Hills, Sage Publications.

Payne, J. L., Morgan, A., & Piquero, A. R. (2020). COVID-19 and social distancing measures in Queensland, Australia, are associated with short-term decreases in recorded violent crime. *Journal of Experimental Criminology*. <https://doi.org/10.1007/s11292-020-09441-y>.

Pietrawska, B., Aurand, S. K. & Palmer, W. (2020b) COVID-19 and crime: CAP's perspective on crime and loss in the age of COVID-19: Crime in Los Angeles and Chicago during COVID-19. *CAP Index*, Issue 19.3.

Prelog, Andrew. (2015). Modeling the Relationship between Natural Disasters and Crime in the United States. *Natural Hazards Review*. 17. 04015011. [10.1061/\(ASCE\)NH.1527-6996.0000190](https://doi.org/10.1061/(ASCE)NH.1527-6996.0000190).

- Pyle, D.J. (1983). The Economic Theory of Criminal Behaviour. *The Economics of Crime and Law Enforcement*, [online] pp.8–28. Available at: [https://link.springer.com/chapter/10.1007%2F978-1-349-05245-5\\_2](https://link.springer.com/chapter/10.1007%2F978-1-349-05245-5_2) [Accessed 31 July 2021].
- Quarantelli, E. L. (2007). The myth and realities: Keeping the looting myth in perspective. *Natural Hazards Observer*, 31(4), 2–3.
- Rae, K., & Subramaniam, N. (2008), Quality of internal control procedures: Antecedents and moderating effect on organizational justice and employee fraud. *Managerial Auditing Journal*, 23(2), 104-124.
- Raphael, S. and Winter-Ebmer, R. (2001). Identifying the Effect of Unemployment on Crime. *The Journal of Law and Economics*, 44(1), pp.259–283.
- Renee Zahnow, Rebecca Wickes, Michele Haynes & Jonathan Corcoran (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.
- Roland Garcia (2017). *What Are The Different Types of Property Crime?* [online] 210 Defense. Available at: <https://210defense.com/what-are-the-different-types-of-property-crime/#:~:text=What%20Are%20The%20Different%20Types%20of%20Property%20Crime%3F>.
- Rosenfeld, Richard, Thomas Abt, and Ernesto Lopez. (2021), *Pandemic, Social Unrest, and Crime in U.S. Cities: 2020 Year-End Update*. Washington, D.C.: Council on Criminal Justice, January 2021.

Roy, S. (2010). *The impact of natural disasters on violent crime*. [online].

Available at:

[http://www.nzae.org.nz/wpcontent/uploads/2011/08/Roy\\_The\\_Impact\\_of\\_Natural\\_Disasters\\_on\\_Violent\\_Crime.pdf](http://www.nzae.org.nz/wpcontent/uploads/2011/08/Roy_The_Impact_of_Natural_Disasters_on_Violent_Crime.pdf).

Sammy Zahran, Tara O'Connor, and Lori Peek. (2009) Natural disasters and social order: Modeling crime outcomes in Florida. *International Journal of Mass Emergencies and Disasters*, 27(1):26–52, 2009.

Sandberg. S, Fondevila. G, (2020), "Corona crimes: How pandemic narratives change criminal landscapes". *Theoretical Criminology*. [sagepub.com/journals-permissions](https://sagepub.com/journals-permissions) DOI: 10.1177/1362480620981637 [journals.sagepub.com/home/tcr](https://journals.sagepub.com/home/tcr).

Saunders, M., Thornhill, A., & Lewis, P (2016). *Research methods for business students*, 7<sup>th</sup> ed. Pearson Education Limited.

Scott SM, Gross LJ (2021). COVID-19 and crime: Analysis of crime dynamics amidst social distancing protocols. *PLoS ONE* 16(4): e0249414. <https://doi.org/10.1371/journal.pone.0249414>

Shabu, Terwase (2017). Natural Disasters and Crime Incidence: A Case of 2012 Flooding in Benue State, Nigeria. *Journal of Agriculture & Rural Development*.

Stickle. B, Felson. M (2020), Crime Rates in a Pandemic: the Largest Criminological Experiment in History. *American Journal of Criminal Justice* <https://doi.org/10.1007/s12103-020-09546-0>.

Thotakura, Dr. (2011). Crime: A Conceptual Understanding. *Indian Journal of Applied Research*. 4. 196-198. 10.15373/2249555x/MAR2014/58.

Treadwell, J. (2013). *Criminology: the essentials*. London; Los Angeles: Sage.

UNODC (2020). *Research brief: Effect of the COVID-19 pandemic and related restrictions on homicide and property crime - World*. [online] ReliefWeb. Available at: <https://reliefweb.int/report/world/research-brief-effect-COVID-19-pandemic-and-related-restrictions-homicide-and-property>.

UNODC (2021), Property Crime Brief, 2020

Wallace, F. (2021). *How Natural Disasters Affect Cybersecurity*. [online] United States Cybersecurity Magazine. Available at: <https://www.uscybersecurity.net/how-natural-disasters-affect-cybersecurity/#:~:text=%20How%20Natural%20Disasters%20Affect%20Cybersecurity%20%201>.

Wickert, Christian (2020). "Routine Activity Theory (RAT)." *SozTheo*, Dec. 2020, [soztheo.de/theories-of-crime/rational-choice/routine-activity-theory-rat/?lang=en](https://soztheo.de/theories-of-crime/rational-choice/routine-activity-theory-rat/?lang=en)

Williams, E. (2021). *Hate crime*. [online] Victim Support. Available at: <https://www.victimsupport.org.uk/you-co/types-crime/hate-crime/>

Wilson, I. (2007), Regulatory and institutional challenges of corporate governance in Nigeria post-consolidation. *Nigerian Economic Summit Group (NESG) Economic Indicators*, April-June, Vol. 12, No 2.

Yang, M.; Chen, Z.; Zhou, M.; Liang, X.; Bai, Z (2021). The Impact Of COVID-19 On Crime: A Spatial-Temporal Analysis In Chicago. *Isprs Int. J. Geo-Inf.* **2021**, 10, 152. <https://doi.org/10.3390/Ijgi10030152>.