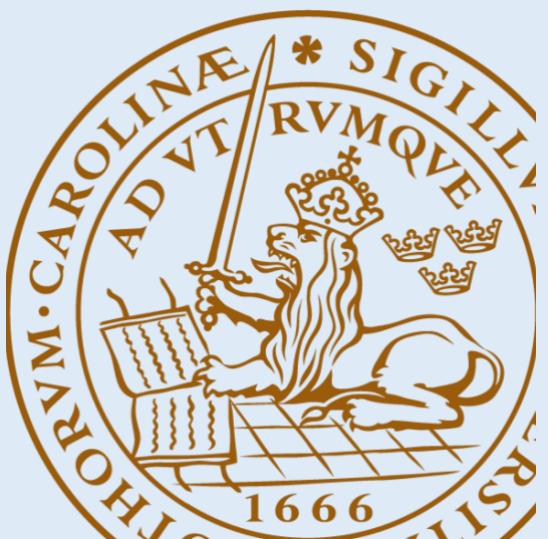


TYPHOON DISASTER RESPONSE AMID THE COVID-19 PANDEMIC: A CASE STUDY OF SUCCESSIVE TYPHOONS IN THE PHILIPPINES IN 2020

LIA ANNE GONZALO & AURIA TIEMROTH | DIVISION
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Lund 2021

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Abstract

The objective of this thesis is to analyze how typhoon response operations in the Philippines were impacted by the COVID-19 pandemic. This multi-hazard scenario is not a singular case, many places around the world have been exposed to similar dilemmas of natural hazards occurring simultaneously as the pandemic. This study was carried out with the intention of better understanding the interplay of concurrent hazards and the type of impact they can cause to society, creating new issues as well as exacerbated preexisting ones. The primary data used for this research consisted of twelve semi-structured interviews with informants from Philippine government and humanitarian organizations and the secondary data is based on existing literature. The results show that a concurrent hazard scenario brings significant challenges to response operations. The health safety regulations presented in order to curb the spread of the pandemic had to be incorporated into all parts of the typhoon response. Changes implemented ranged from the switch to remote working and increased reliance on digital technology; the use of PPE at all times; physical distancing, especially at the evacuation sites; to the restrictions on movements around the country. This study has shown that there is still a lot to learn with regards to this topic. It has also shown that there is a growing need to invest more in preparedness, as well as adopt a more holistic and flexible approach to planning when it comes to hazards in the future.

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We would also like to thank all our family and friends who have supported and encouraged us throughout the entire process. We thank you for lending an ear whenever we needed them, whether it was thesis related or not. We are also grateful for all of the great advice you gave us.

The COVID-19 pandemic has had a profound impact on all of us in the past year; separating us from loved ones and taking the lives of many along the way. We dedicate this thesis to all the victims of the COVID-19 pandemic and the typhoons in the Philippines. May you rest in peace.

Summary

The COVID-19 pandemic has left what may be considered an unimaginable impact on every aspect of daily life. The Philippines, a country prone to natural hazards, was one of the countries that had to confront the intersection of both the COVID-19 pandemic and that of climate-related hazards, facing the challenge of responding to series of destructive typhoons while sustaining COVID-19 response efforts and abiding by infection prevention and control guidelines.

This study looks to investigate two research questions: “How did the COVID-19 pandemic impact the response to the triple typhoons in multiple regions of the country?” and “How did the typhoon response operations adapt to the pandemic?”. To answer these questions, informants from the Philippine government and non-governmental organizations that were involved in the different affected regions were contacted and interviewed. The interviews were conducted remotely due to travel restrictions that were in place due to the pandemic. In order to complement the data collected via interviews, information was also gathered from humanitarian reports, news articles and grey literature.

The results of this study show that COVID-19 generated additional needs that required creativity in response. In terms of structure, typhoon response operations remained the same, but all sectors had to incorporate health guidelines in order to control the spread of the virus. Effects were seen across the different response clusters, especially for Health, Logistics, Emergency Telecommunications, Relief Distribution, Camp Coordination and Management, Search and Rescue, Protection, and Education. The strict use of PPE and adherence of physical distancing and frequent testing were among the policies implemented. There was a significant change to alternative work arrangements, organisations resorting to remote work and the use of digital technologies and social media to transmit messages to the public in order to minimize interactions with colleagues, as well as the public. Having multiple hazards such as the typhoons occurring amid the COVID-19 pandemic also put additional strain on funding and other resources. Restrictions on travel and quarantine rules created delays in movement, limiting the mobility of populations and the sending goods from one area to another. This resulted in the reliance on local partnerships, which paves the way for local communities having increased participation in disaster risk management processes.

From the results of this study, it was found that there is a tendency to focus on a single hazard and the situation of concurrent crises can cause disruptions to response operations. The intersection of these concurrent disasters highlights the need to consider compound risks in response plans. Flexibility in response is vital in order to balance such risks. New threats may continue to emerge in the future, and countries must be prepared to handle them.

List of Abbreviations

AFP	Armed Forces of the Philippines
CALABARZON	Cavite, Laguna, Batangas, Rizal, and Quezon Region
CDP	Center for Disaster Preparedness
DepEd	Department of Education
DILG	Department of Interior & Local Government
DOH	Department of Health
DPWH	Department of Public Works and Highways
DSWD	Department of Social Welfare & Development
FAO	Food & Agriculture Organization
FEMA	Federal Emergency Management Agency
IATF	Inter-Agency Task Force
LGU	Local Government Unit
MDRRMO	Municipal Disaster Risk Reduction & Management Office
NDRRMC	National Disaster Risk Reduction & Management Council
NGO	Non-Governmental Organizations
OCD	Office of Civil Defense
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PCG	Philippine Coast Guard
PCOO	Presidential Communications Operations Office
PDRF	Philippine Disaster Resilience Foundation
PWD	Person With Disability
UNICEF	United Nations Children's Fund
RDANA	Rapid Damage Assessment and Needs Analysis
UN DRR	United Nations Office for Disaster Risk Reduction
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
WFP	World Food Programme
WHO	World Health Organization

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Chapter 1: Introduction

1.1.1 Background and motivation

The COVID-19 pandemic has caused significant social and economic disruptions across the world, claiming more than 3 million lives as of May 2021 (WHO, 2021). Countries have implemented various measures to contain the transmission of COVID-19, which included the closure of internal and external borders, restrictions on population movement, social distancing, and meticulous hand hygiene (WHO, 2020). All of these occurred alongside a year that had recorded 389 disasters—higher than the annual average from the years 2000-2019 (CRED & UNDRR, 2021). The presence of COVID-19 and the resulting restrictions posed an additional complication for the disaster response to these events, as it was expected that interventions meant to control COVID-19 are somewhat incompatible or run counter to strategies to protect populations from tropical cyclones (Shultz et al., 2020). When COVID-19 was declared a global pandemic by the World Health Organization (WHO) in March 2020, it was anticipated that the pandemic will intersect with other hazards (Phillips et al., 2020). The WHO issued an advisory regarding preparedness for natural hazards such as tropical cyclones, floods, and earthquakes that may occur during the pandemic. Government agencies around the world prepared operational guidelines for evacuation and search and rescue processes in the event of climate-related disasters (FEMA, 2020). In the Philippines, the National Disaster Risk Reduction and Management Council (NDRRMC) and the Department of Interior and Local Government sent out guidelines as early as May 2020 to prepare for the rainy season while considering COVID-19 infection prevention and control (DILG, 2020). These guidelines were tested upon the arrival of the Typhoon Vongfong (Philippine Name: Ambo), the first typhoon in the 2020 Pacific typhoon season, and later in the year when three powerful tropical cyclones—Typhoon Molave, Goni, and Vamco arrived in close succession.

There was risk of community transmission in the country at the time of the typhoons (UN OCHA, 2020a), and the National Disaster Risk Reduction and Management Committee (NDRRMC) had to make adjustments in their operations in order to abide by national pandemic guidelines. At the time of the Typhoon Molave, the Philippines' COVID-19 case tally was at 370,000 with 35,015 active cases (CNN Philippines, 2020). Apart from this, the Philippine economy suffered serious downturns due to the pandemic, with its Gross Domestic Product declining -9.5% in 2020 ((Philippine Statistics Authority, 2021). An estimated 1.7 million jobs were also lost in the 12 months to January 2021 (Bird, Lozano, & Mendoza, 2021). Hunger incidence in the country increased due to the pandemic, reaching a record-high of 30.7% in September 2020 (Social Weather Stations, 2020), adding to increased vulnerabilities.

The situation in the Philippines with the three typhoons can show how the COVID-19 pandemic created shifts in how societies operate not only on a daily basis but also during times of emergency. With no foreseeable end to the current pandemic and the 2021 Pacific typhoon season beginning, it is important for disaster response managers to learn how to deal with

two concurrent crises and compound risks. Even before COVID-19 occurred, experts had already been predicting the possibility of major epidemics and pandemics happening (Fan, Jamison, & Summers, 2018). While the scale of the current pandemic is unprecedented, it is unlikely to be the last global pandemic and the lessons learned from this particular disaster can be used to inform future disaster response strategies.

1.2 Purpose and Research Questions

This study aims to understand how these anticipated effects of the pandemic and subsequent preparedness measures played out in the case of the Philippines when it was hit by a series of three destructive typhoons within a three-week period, from October 25 to November 13, 2020. This is done through an exploratory case study approach that looks into how organizations involved in disaster response to Typhoons Molave, Goni, and Vamco were affected by COVID-19 and how they have adapted to this “new normal”. The objective is to understand the interplay between a natural hazard and a public health crisis and how the organizations have confronted this situation. Tropical cyclones are a regular occurrence in the Philippines and every year, government agencies provide seasonal forecasts to inform preparedness, but the COVID-19 pandemic has compounded these events and put an additional strain on the resources of responding organizations. This study focuses on the three specific regions that were hardest hit by the series of typhoons: the Bicol Region (Region V), Cagayan Valley Region (Region II), and the CALABARZON (Region IV-A) as seen in Figure 1. The knowledge gained from this study can then be used by disaster response managers in preparing for similar emergency scenarios in the future.

The research questions tackled in this study are: How did the COVID-19 pandemic impact the response to the triple typhoons in multiple regions of the country? How did the typhoon response operations adapt to the pandemic?

1.3 Case Description

The successive typhoons in late 2020 in the Philippines was chosen as a case study due to the The Philippines is an archipelago that lies in the western North Pacific Basin, the world’s most active basin for tropical cyclone activity (Gao, Zhu, Zhang, & Shen, 2020). The country ranks 9th on the World Risk Index, which is based on exposure to disasters, vulnerability, susceptibility, coping and adaptive capacities (Behlert et al., 2020). An average of 20 tropical cyclones enter the Philippine region each year, with 8 or 9 of them making landfall (PAGASA, 2020). From late October to November 2020, the country was hit by a series of three major typhoons. This happened at a time when the country was still dealing with the effects of the COVID-19 Pandemic, and when multiple regions were under varying conditions of community quarantine.

By this time, the country had been dealing with the COVID-19 pandemic since March 15, 2020, and when the typhoons struck, many local government units were already experiencing a strain on their resources due to the effect of the pandemic on the local economy and the resulting community quarantine restrictions.

1.4.1 Series of Typhoons

Tropical Cyclone Molave, known locally in the Philippines as Quinta, was a typhoon with maximum sustained winds up to 130 kph and made landfall over the Albay Province in the eastern Philippines on October 25, 2020. It left 27 dead and affected up to 888,375 persons across seven regions of the Philippines. Some of its effects included flooding, soil erosion, damage to houses, infrastructure, and agriculture. A state of calamity was declared in five provinces and 13 municipalities, including Albay Province (NDRRMC, 2020a).

Typhoon Molave left the Philippine Area of Responsibility on October 27, 2020, and soon after tropical cyclone Goni entered the PAR and intensified into a Super Typhoon before making landfall in the Bicol Region in the eastern Philippines on November 1, 2020 (Figure 1). Typhoon Goni, known locally in the Philippines as Super Typhoon Rolly, was the strongest tropical cyclone of 2020, with maximum sustained winds up to 225 kph and gusts up 280 kph (Philippine News Agency, 2020). It went on to cause catastrophic damage to the rest of the region, with 24 dead and 399 injured across 5 regions (NDRRMC, 2020c). Initial assessments of Catanduanes Island by the Red Cross found that 80-90% of buildings were damaged by the typhoon (BBC, 2020). The region was still recovering from the impacts of Typhoon Molave which caused serious damages the week prior to Typhoon Goni's landfall (NDRRMC, 2020b). An estimated 3.3 million people were affected by Goni, with 1.2 million of them displaced (UN OCHA, 2021b). Those evacuated included 178 COVID-19 patients and 417 healthcare and support staff (NDRRMC, 2020c).

On November 11, another typhoon, Vamco, locally known as Typhoon Ulysses, made landfall in Quezon Province north of the Bicol Region (NDRRMC, 2020a). This typhoon caused historic levels of flooding in Metro Manila and the CALABARZON Regions. Cagayan Region in the northern Philippines was not directly under the track of Typhoon Vamco, but it affected the tail-end of the monsoon which resulted in devastating floods due to the accumulation of water from the series of tropical cyclones combined with the saturated soils and the release of water from Magat Dam. In Tuguegarao City, the capital of Cagayan Province, COVID-19 quarantine facilities were also affected by the flooding and had to be evacuated. About 5.2 million people were affected by Typhoon Vamco across the Philippines, with an estimated 1.2 million people displaced (UN OCHA, 2021b). The typhoon left 101 dead across the country (NDRRMC, 2020a).

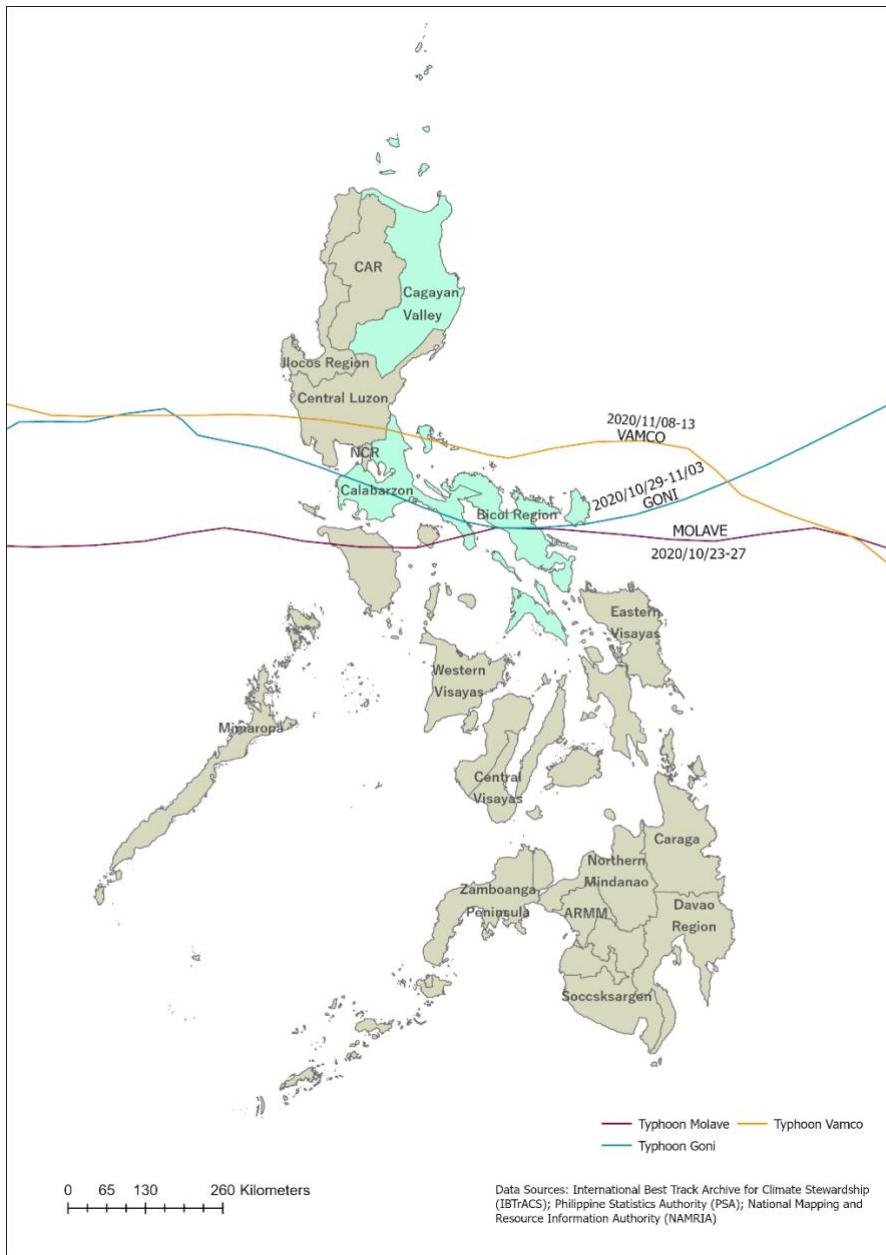


Figure 1. Regions of the Philippines affected Tropical Cyclones Molave, Goni, and Vamco. Regions highlighted in green are the focus of this case study.

1.4.2 The COVID-19 Pandemic Response in the Philippines

To understand the COVID-19 interventions put in place in the Philippines, a timeline of significant events is shown in Figure 2. On March 8, 2020, a State of Public Health Emergency was declared in the Philippines due to the COVID-19 Pandemic (Proclamation No. 922). This allowed the government to mobilize the appropriate resources to help contain the pandemic. With the public health emergency declared, this was then used as basis to place the country under a State of Calamity for a period of six months (Presidential Proclamation No. 929, 2020), which opened up funding for the COVID-19 pandemic response. Guidelines were issued for *community quarantine* on March 15, 2020, when Republic Act No. 11469 also known as the

‘Bayanihan to Heal as One’,¹ was enacted to allow the President special powers to address the pandemic. The island of Luzon including the National Capital Region was placed under strictest level of Enhanced Community Quarantine (ECQ) from March 15, 2020. The National Action Plan for COVID-19 was also approved within the same month on March 25, which designated national and local Disaster Risk Reduction and Management Councils (DRRMCs) as COVID-19 Task Forces. The Inter-Agency Task Force on Emerging Infectious Diseases (IATF-EID) was created to lead in the pandemic response. At the time of the typhoons, most of the Philippines was under Modified General Community Quarantine (MGCQ) that allowed for more relaxed guidelines such as a return to full operational capacity but following minimum health protocols. Table 1 shows the system of community quarantine levels implemented in the Philippines since March 2020.



Figure 2. Timeline of COVID-19 Quarantine Declarations and Late 2020 Typhoons

These declarations and community quarantine guidelines in response to the pandemic have also impacted the way disaster response operations are conducted. With the Philippines’ high exposure to natural hazards, it was anticipated by the NDRRMC that there might be other disasters that would occur while the pandemic was still ongoing, as reflected in their guidelines sent out to member agencies May 2020 (NDRRMC, 2020d; NDRRMC, 2020e). NDRRMC guidelines mentioned the need to consider other natural and human-induced hazards and the resulting adjustments that must be made for disaster response. These guidelines include adherence to minimum health standards in the conduct of field validation activities; work from home arrangements and a shift to the use of digital technologies for communications and other response activities. Remote coordination became the norm, along with paperless communications. These guidelines also specifically mention the prioritization of the health and safety of personnel and the general public in response to COVID-19 and other disasters. This has implications across the four phases of disaster risk management that the Philippines’ National Disaster Risk Management plan adheres to. This study will look into theses in disaster response operations that were a result of the pandemic restrictions. Movement and quarantine restrictions are part of the basic guidelines needed to reduce COVID-19 transmission, which have an effect on the deployment and mobilization of

¹ Bayanihan means “a spirit of civic unity and cooperation” in Filipino (Oxford University Press, 2021)

resources needed for disaster response. The series of successive typhoons alone have caused significant disruptions to the economy with their impacts on agriculture and consequently, food security, which increases the vulnerability of the affected populations (UN OCHA, 2020d). They have also damaged critical infrastructure such as water supply systems which are an essential part of the COVID-19 response which needs increased WASH measures (UN OCHA, 2020d).

Table 1. COVID-19 Community Quarantine Levels in the Philippines. Adapted from PCOO, 2020.

	ECQ	MECQ	GCQ	MGCQ
Population	100% Stay at home	100% Stay at home	Vulnerable groups (Elderly, PWD, etc.) Transmitters stay at home	Limited to accessing essential goods and services, for work in the offices or industries permitted to operate Vulnerable groups (Elderly, PWD, etc.) and people below 21-years old stay at home
Outdoor Exercises	Not allowed	Limited outdoor exercise allowed	Indoor and non-contact sports allowed Spectators in all non-contact sports and exercises are still prohibited	Indoor and non-contact sports allowed Spectators in all non-contact sports and exercises are still prohibited
Gatherings	Not allowed	Restricted to max 5 persons	Restricted to max 10 persons	Fifty percent (50%) of the seating or venue capacity for movie screenings, concerts, sporting events, and other entertainment activities, religious services, and work conferences
Travel	No public transport No domestic or international flights	No public transport No domestic or international flights Controlled inbound travel (Returning Filipinos only) Biking and non-motorized transport encouraged	Public transport allowed with social distancing Inter-island travel allowed for GCQ to GCQ areas with safety protocols	Public transport allowed with social distancing
Work and Government Services	Skeletal workforce on-site Work from home	Skeletal workforce on-site Work from home	Alternative work arrangements (4-day work week, etc.)	Full operational capacity with health protocols or alternative work arrangements

Chapter 2: Concepts

This chapter introduces the complex systems theory that was used as basis for the analysis. Terms for different types of risks that are mentioned throughout the study are also provided below. A brief background on disaster management and the definition of disaster response used for this study is presented, followed by other concepts that were used to structure the data collection process and results chapter.

2.1 Complex Systems Theory

The focus of this case study is the concurrent events of having multiple typhoons amid the COVID-19 pandemic, as the intersection of climate hazards with a biological hazard poses an additional risk to populations. To understand the situation of having concurrent hazards that have various interacting components, a systems thinking approach can be used to identify the interactions between various elements of climate-related disaster response and pandemic response. A complex system is a network of systems with a number of interactions amongst its various components (Ladyman, Lambert, & Wiesner, 2013). The relations amongst the parts, or components, define the structure of the system, as well as the manner in which it operates (Broska, Poganietz, & Vögele, 2019). Complex systems are commonly described as being non-linear and spontaneous, portraying this through resulting feedback loops (Broska et al., 2019). The complex systems theory can be useful as a sense-making framework when dealing with unexpected events (Cavallo & Ireland, 2014). By creating a better understanding of the different relations amongst the components of a network, it is possible to strengthen the resilience under any threat or disruption (Cavallo & Ireland, 2014). Although these systems demonstrate such complex behavior, they can have a high level of robustness. This is due to the fact that control of the system is not central but instead distributed; meaning that if the system were to be disturbed, the entire system would not be instantly affected as there would be a buffer (Ladyman et al., 2013).

2.2 Cascading and Compound Risks

The COVID-19 global pandemic can be considered an emergent risk (UNDRR, 2020) that has sent cascading shocks and disruptions to almost every area of society since it first began in late 2019. It has demonstrated how complex and interconnected the world is and the importance of perceiving the world from a systems perspective (UNDRR, 2020). A systems theory approach can be applied to disaster response to better understand these interdependencies between a biological hazard such as COVID-19 and the hydrometeorological hazards such as typhoons. When explaining the interdependent relationship between hazards or risk, there are a number of terms often applied; interconnected, interacting, cascading and compounding (Pescaroli & Alexander, 2018). Interconnected and Interacting risk are not as readily referred to as cascading and

compounding risks, however, they do place emphasis on the dynamics of a system or network (Pescaroli & Alexander, 2018). The two terms are very similar, however, they differ due to the context in which they have been applied; interacting risks are used more in the earth sciences while interconnected risks are discussed more on the systems theory aspect (Pescaroli & Alexander, 2018). Cascading risk usually implies that there is a chain of causality, whereby one hazard can trigger another in sequence across multiple scales and result in a disaster (Zaidi, 2018). COVID-19 is an example of a threat that has cascading effects, as it has had far-reaching effects on multiple aspects on society. It has put health systems under severe strain, caused economic shutdowns, the closure of schools, and has affected mental well-being due to the imposition of isolating measures (Sahin et al., 2020). It also showed how interconnected the global economy is, with restrictions on population mobility and transport also having effects on labor markets and supply chains, thereby affecting food security (Felsenstein, Shmueli, & Thomas, 2020).

The impact of a biological hazard such as COVID-19 is already significant on its own, but with other hazards occurring within the same area and same time frame, this is called compound risk (UN OCHA, 2021a). A compound risk involves the interaction of multiple hazards that amalgamate to create disasters of a greater detrimental scale, resulting in widespread losses (Zaidi, 2018). The aftermath could be even worse as compounding hazards would only exacerbate the disaster outcomes (Felsenstein et al., 2020). Some of the compounding effects that COVID-19 has created include challenges to traditional disaster response strategies, causing emergency responders to re-evaluate existing plans to adapt to the changes brought about by the pandemic.

2.3 The Four Phases of Disaster Management

Disaster management can be described as a form of organized emergency response which aims to reduce human suffering and damage to the built environment around them (Coppola, 2011). It can be divided into four different phases which includes preparedness, mitigation, response and recovery (Coppola, 2011). Preparedness and mitigation referring to phases prior to the impact of a hazard, while response and recovery occur in the aftermath (Bullock, Haddow, Coppola, 2013). Preparedness often refers to making sure that people who live in hazard prone areas, are equipped with all necessary tools and resources needed to raise their chance of survival, while also minimizing the amount of damage that is inflicted (Coppola, 2011). Mitigation looks more into taking action such that the risks of a hazard are reduced; reducing the threat to the exposed population (Bullock et al., 2013). Response, which is the main focus of this research paper, is the action taken to reduce or eliminate further consequences during or in the aftermath of a hazard (Coppola, 2011). The NDRRMC states that the goal of disaster response is to “provide life preservation and meet the basic subsistence needs of affected populations based on acceptable standards during or immediately after a disaster” (NDRRMC, 2011, p.2). The final phase, recovery, firstly deals with the goal of achieving some degree of normalcy to the lives of the affected populations (Coppola, 2011). Unlike the response phase, the recovery phase does not have a specific time

frame, beginning immediately after the response phase but persisting for a few months to several years (Coppola, 2011).

2.4 The Cluster System

Disaster response is a multifaceted activity that involves organizations with different mandates. In the Philippines, the National Disaster Risk Management Plan has adapted the cluster approach, similar to that of the international humanitarian coordination system composed of UN and Non-UN Agencies. The cluster system is a coordination mechanism that groups organizations according to function, with a specific agency leading each cluster. This is meant to define clear roles and responsibilities in response, avoiding redundancies and allowing for more efficient operations. The Philippine Response Cluster System is detailed in the National Disaster Response Plan for Hydro-Meteorological Hazards (NDRRMC; DSWD, 2018), and is composed of government agencies, humanitarian and civil society organizations, the private sector, and volunteers. It has 11 clusters that correspond to Search, Rescue and Retrieval, Camp Coordination and Camp Management, Food and Non-Food Items, Logistics, Emergency Telecommunications, Protection, Health, Education, Law and Order, and Management of the Dead and Missing. These are led by national government agencies as seen in Figure 3. When it comes to COVID-19 Pandemic Response, the Department of Health is the designated lead, as mandated by the National Disaster Response Plan. The NDRP states that as head of the Health Cluster, the DOH is tasked with “preventing and controlling the spread of communicable and non-communicable diseases” (NDRP, 2018). This cluster system was used as a starting point for contacting organizations to include in this study, as they are the ones heavily involved in typhoon disaster response operations.

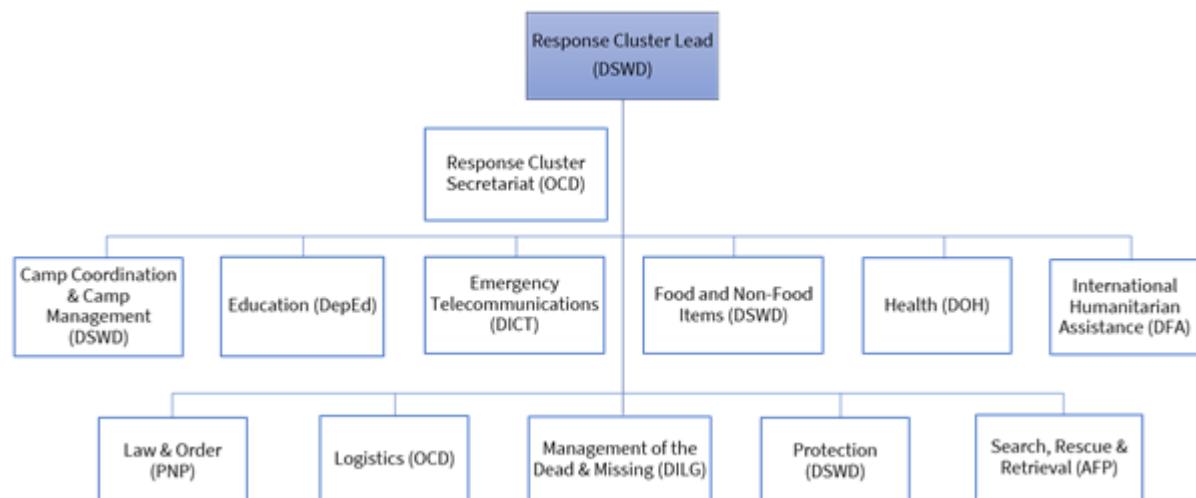


Figure 3. Response Cluster System in the Philippines. Adapted from NDRRMC Interim Guidelines on Disaster Response Operation simultaneous with COVID-19 Response

2.5 Agent- and Response-generated needs

To gain a clearer picture of how COVID-19 affected the typhoon disaster response operations, data collected for this study are classified into either agent-generated or response-generated needs. Agent-generated needs are the demands created by a disaster agent (Quarantelli, 1996); the agent in the case of this paper being the typhoons. The demands will often vary depending not only on the magnitude of impact of the disaster, but also the type of disaster (Quarantelli, 1996). The agent-generated needs in this paper includes the evacuation process, the search and rescue and the procurement of necessity goods. Response-generated needs refer to the demands created by the responding organizations in order to cope and manage the disaster in question (Quarantelli, 1996). Unlike the agent-generated needs, response-generated needs are common to all disasters (Quarantelli, 1996); they include early warnings and advisories, policy and plan updates, accessibility, camp coordination and management, logistics, aid distribution and funding.

Chapter 3: Methodology

This chapter will outline the methodology applied in order to carry out this study. It will highlight the chosen research strategy, which data collection methods were used and how that data was then analyzed. It will also discuss the ethical considerations taken and limitations experienced throughout the study.

3.1 Research Strategy

This research on the response to three different typhoons during the ongoing COVID-19 pandemic is designated as an exploratory case study, primarily due to the fact that not a significant amount of information is available pertaining to this topic (Blaikie, 2010) as it is a very recent and unfamiliar occurrence (Lawrence Neuman, 2014). An exploratory case study such as this one, does not necessarily always manage to achieve a final answer or solution to a problem (Lawrence Neuman, 2014) but rather seeks to address what the impacts are when a part of the world is faced with concurrent disasters of such great scale. The study focuses on understanding the complexity of response under multiple hazards and therefore utilizes the complex systems theory as a form of guidance when trying to grasp the interplay between them. This research primarily centers around the impact that the pandemic has had on typhoon response, with primary focus on the impacts on early preparedness prior to the typhoons making landfall, the response after landfall and then briefly how early recovery was impacted.

3.2 Data Collection

3.2.1 Primary data

This study's main priority is to understand how the COVID-19 pandemic has influenced the work of those involved with typhoon response operations in the Philippines. In order to gain a better understanding, semi-structured interviews with open-ended questions were carried out to collect data that will serve as the primary foundation for this study. The reason for utilizing semi-structured interviews is primarily due to the topic in focus being related to recent events and therefore not a significant amount of literature exists (Lawrence Neuman, 2014) thus collecting data from those working directly with the typhoon response activities is considered a necessity. The open-ended questions were formulated with the intention of encouraging discussion and a diverse range of answers from the different informants (Creswell, 2013).

Due to the pandemic, field research was not a feasible option and therefore the interviews had to be conducted remotely via zoom. There were 12 interviews conducted with 14 individual informants that were interviewed representing a total of 12 different organizations,

as shown in table 2 below. Purposeful sampling was done for this study, meaning that the researchers selected participants they concluded would inform the research purpose well (Creswell, 2013). The informants included Philippine government organizations, international humanitarian agencies and local non-governmental organizations as these were the main actors of working involved in typhoon response. As the three typhoons affected a wide area, the sample population or the informants were selected more on the basis of areas that were most impacted by the natural hazard. News articles and reports mentioned that some organizations were involved in the response for multiple typhoons used in this study and therefore selecting them as informants was invaluable. Researchers did not target one specific area as the goal is to get general insights on response overall. The researchers also aimed to reach out to a variety of organizations with varying backgrounds and areas of expertise in order to get a diverse range of perspectives and determine whether there was any defining difference in how different work clusters were affected under modified working conditions.

The interviews lasted 40 to 60 minutes long depending on the availability of the informants, and were conducted primarily in English, with both of the researchers taking turns in asking the questions (see Appendix B for Interview Guide). There were a few cases in which the interviews were conducted in Filipino and the researcher with knowledge of the language would then conduct the entire interview and thereafter translate the transcript into English in preparation for data analysis. The majority of the interviews were also conducted without questions being disclosed beforehand; however, in some cases, the informants would request them so that they could better prepare for the interview and gather the information they need. The downside to providing the interview questions prior to the interview could be that there is a chance that the quality of answers may differ depending on who got the questions beforehand and were more prepared over those who did not. The structure of the interview might also less flexible with those who received the questions beforehand as there is a tendency to feel the need to follow the structure and order of the question guide. Although the interviews were recorded, one researcher also made sure to take notes throughout to keep track of what was already said and also as an extra precautionary measure in case there were any technical problems. Following each interview, the researchers would have a debriefing session and discuss learnings from the particular interview and highlight the most standout points made.

Table 2. List of Informants that participated in the study

	Organization	Informants Present	Function
Local NGOs			
1	Center for Disaster Preparedness (CDP)	1	Local NGO
2	Philippine Disaster Resilience Foundation	1	Local NGO
Philippine Government Offices			
3	Department of Health (DOH)	1	Health Emergency Management

4	Department of Social Welfare and Development Field Office No.5	1	Disaster Risk and Reduction Management Office
5	National Disaster Risk Reduction and Management Council (NDRRMC) Operations Center	1	Response Cluster Command Center
6	The Office of Civil Defense	1	Implementing arm of the NDRRMC in Region II
7	Philippine Coast Guard (PCG)	1	Search, Rescue and Retrieval Cluster
8	Tanay Municipal Disaster Risk Reduction and Management Office (Tanay MDDRRMO)	2	Local Government DRRM Unit
9	Tuguegarao City Disaster Risk Reduction and Management Office (CDRRMO)	1	Local Government DRRM Unit
United Nations			
10	Food and Agriculture Organization (FAO)	1	Emergency Coordination/Food Security Cluster
11	United Nations Office for the Coordination for Humanitarian Affairs (UN OCHA)	2	Emergency Coordination/Coordination Cluster
12	United Nations Entity for Gender Equality and the Empowerment of Women (UN Women)	1	Protection/Food Security Cluster

3.2.2 Secondary Data

In order to support the primary data collected during the interviews, different data from publicly available sources were gathered such as scientific literature, news articles and field reports produced by the different organizations that were involved with the response operations. As the events were ongoing and continuously developing, scientific literature was challenging to find but towards the second half of the research period, more sources became available. Due to the lack of readily available scientific literature on the topic of interest, news articles were also used as data sources. The data collected from these sources were also helpful in understanding the roles that different organizations played in the different response operations and which clusters they were responsible for. This was particularly beneficial when scoping out possible contacts for the collection of the primary data. All the secondary data was initially reviewed by both researchers to make sure they had useful information for the purpose of the research and thereafter a deeper review and analysis could be carried out.

3.3 Data Analysis

As a first step to the data analysis, the researchers made sure that all the interviews were transcribed such that it could be easily stored and accessible during the analysis stage (Creswell, 2013). A program called NVIVO was used in order to compile and order the aggregated data and then analyze it through the use of coding (Creswell, 2013); data including the interviews, organization reports, articles and scientific literature. The coding of the information was carried out in different stages (Saldaña, 2013). The initial stage, or first cycle, was composed of the general reflections, the first observations, stand out topics discussed within the data (Saldaña, 2013). The researchers initially started the coding process by creating a few tentative codes associated with themes considered prior and during the data collection stage (Creswell, 2013). These codes were then matched with the text of the different data (Creswell, 2013). When new information was introduced to the database created, the researchers would create new codes accordingly (Creswell, 2013). The second cycle or stage involved a more in-depth analysis; reducing any irrelevant data by categorizing and prioritizing the selected codes to find themes and allow for better theory development for our case description (Creswell, 2013; Saldaña, 2013).

3.3.1 Causal Loop Diagrams

To understand the complex interdependencies of the different components of the disaster response system, a causal loop diagram was produced from the data collected. The CLD allows for a clearer visualization of the causes-and-effects and potential feedback loops within the system, with positive and negative effects denoted by “+” and “-” signs, respectively (Berariu, Fikar, Gronalt, & Hirsch, 2015). The specific effects are also explained in a table. The Vensim PLE software for modeling system dynamics was used to create the diagram in Section 5.3. Variables were created in the software based on the data collected from interviews and reports, then linked together to create a diagram.

3.4 Ethical Considerations

As this is qualitative research, it is important that ethical considerations are addressed at all stages throughout the entire duration of the study, during planning stage up until the study has been finalized and published (Creswell, 2013). Consent forms were sent out via email prior to the interviews so that the informants were aware that the interview would be recorded (Appendix C). The consent form also provided details on what the purpose of their involvement was as well as the conditions of their participation (SRA, 2003). The interviews were entirely voluntary and therefore the informants were also aware that they could choose to decline to answer any question or withdraw from the project at any time. The informants' identities have also been kept anonymous; any quotes from the interviews included will be represented as an organization. The research does not aim to critique the response measures

carried out by different organizations and neither does it compare them to one another. The information collected from the informants will be used to present the different perspectives and highlight their motivations. As the events outlined in this study have been ongoing throughout the time of writing this thesis, the researchers took into account that the organizations were still occupied with relief and recovery operations. The Philippines, as most other countries around the world, were at the time of writing working on plans for providing people with vaccines against the COVID-19 virus all while working on the recovery to the typhoons thus the researchers made sure to take this into consideration by respecting and taking the schedules of the informants as a priority. In order to achieve this, the researchers made sure to keep their schedules flexible in order to accommodate accordingly.

3.5 Limitations

One of the limitations experienced during this research was choosing and getting in contact with potential informants in the early stages of the study. Researchers had to first find the areas most affected and then the organizations that were involved. It was significantly difficult in establishing contact mainly due to organizations still being involved in ongoing operations in the country. Although the researchers managed to get in contact with several organizations, it was not always successful. Not all desired participants were able to partake in the study, and thereby this may have resulted in gaps in certain areas. In order to compensate for this, and fill in any missing information to the study, secondary sources were utilized.

The organizations that were interviewed, were all from a range of different clusters and were working according to their field of expertise; clusters are divisions according to function within a coordination system utilized by organizations to define clear roles during response. The researchers had the intention of speaking to at least one representative from each cluster in order to get a diverse range of perspective, however, it could be perceived that having a single source of information for one particular cluster doesn't provide a good enough representation and the researchers recognize this as a flaw. The same applies for geographical scope, since only a limited number of geographical areas are covered in this study and disaster response activities can differ from area to area. Having informants of diverse backgrounds and specialties also meant that the interview questions were slightly adapted to each organization such that all questions would be applicable to them (Creswell, 2013), presenting what could be perceived as inconsistent data collection since there was not standard format.

Remote interviews, although practical, also has its disadvantages as technology can be unpredictable at times. In a few cases, the internet connection of the informants was not always very stable and so the flow of communication was at times disrupted and question and answers were sometimes misunderstood or unclear. Lack of stable internet connectivity also resulted in some planned interviews not being conducted. Another downside to remote work is that it limited the number of informants that could potentially have been contacted. Collecting data in the field would have allowed researchers to visit more isolated areas within

the typhoon affected areas, make firsthand observations and also speak directly with local officials regarding how they had tackled the response.

As the researchers have set this research to primarily focus on the impact on early preparedness, the response after landfall and the early recovery stages, the scope of the study may have been limited in that there may be gaps within the information collected and analyzed.

Chapter 4: Results

This chapter presents the findings from the interviews and the secondary document sources. The results are classified according to typhoon disaster agent-generated needs and response-generated needs. For this section, information obtained from the interviews are categorized according to the cluster system presented in Section 2.4. This allows for the identification of new demands that arose from the combination of the two events, and how they affected response operations for both the typhoons and the pandemic.

4.1 Disaster Agent-Generated Needs

Agent-generated needs are those which arose from the specific disaster event. In this study, these are considered to be the needs of the populations affected by the consecutive typhoons during the COVID-19 pandemic.

4.1.1 Evacuation, Search and Rescue Process

The effects of the triple typhoons included wind damage, flooding, soil erosion, and landslides, resulting in the need to evacuate people in affected areas (NDRRMC, 2020; NDRRMC, 2020b; NDRRMC, 2020a). One of the LGU informants from the hard-hit area of Tuguegarao City in Cagayan Province talked about how they implemented pre-emptive evacuation in anticipation of flooding. For these evacuations, limitations were put in place on the number of people who could be transported at a time so that vehicles would not be overcrowded. This prolonged the evacuation process but was considered necessary due to uncertainty if the persons had COVID-19. However, when the flooding had started and more people needed to be evacuated, the priority was to get people out and there were no longer strict limitations on the number of people per vehicle.

For search and rescue, responders had to follow COVID-19 health protocols by wearing personal protective equipment (PPE) when conducting response operations that involve physical contact with many people. These PPE varied per instance, as in some cases they had to wear a gown, hair nets, and shoe covers while in other situations a mask and face shield were enough. This was difficult for some responders depending on the type of operations they were doing. One informant in the Cagayan Region said:

"We have incorporated the management of COVID-19 in our protocols for our disaster response, such as the use of PPE and face masks and face shields. But those protocols were not always strictly followed simply because you have to choose between life and death. If we maintain using all those PPEs in the middle of the rescue, it will hamper our retrieval. At the same time, it's risking our responders because they can get injured due to slipperiness of the PPE. So at that time, it's the dedication and will to retrieve the individuals and families at risk"

that was prioritized, and then balancing the effects of COVID-19 on our responders came later.” - LGU

However, when it came to evacuating confirmed COVID-19 cases in quarantine facilities affected by flooding, PPE requirements were fully complied with to avoid transmission of the virus. In this region, most COVID-19 cases had already been transferred to these quarantine facilities, therefore there was some reassurance that in the villages they were going to, either there were no confirmed cases or they had already been transferred. They would ask the barangay officials first if there were cases before they entered.

In the Cagayan Region, unprecedented levels of flooding had also affected areas that were not known to be at high risk of flooding, prompting the need for rescue of residents whose houses had been inundated. People had to move to their roofs to wait for rescue overnight, because rescuers could not go to them immediately at nighttime due to lack of visibility. Two informants emphasized the risks that their responders faced:

“It (COVID-19) was a big disadvantage. We don’t want our personnel to be in danger. Our biggest concern is the safety of our personnel, that’s our priority. It will be hard if we’re rescuing people and our personnel also need to be rescued. But we have alternatives to avoid those kinds of situations. We have mandatory monthly swab testing. Any personnel that is in a difficult situation (e.g. feels sick), we don’t deploy them. We think of the welfare of our personnel.” – Government Agency

“Responders were risking their lives with flooding and COVID-19. You had to think of two things, you want to save citizens from the flood, from drowning. At the same time in evacuation centers they need to be safe from COVID-19 because any moment that there is an outbreak of COVID-19 in an evacuation center, the next time a flooding incident happens, it would be harder to encourage people to evacuate. They may think, why would I evacuate? if I don’t die from drowning, I’ll die from COVID-19. We really needed to prioritize avoiding transmission in evacuation centers” – Government Agency

These show that their primary concern was the safety of their personnel, as they cannot have their own responders needing to be rescued as well. Extra caution was needed as responders also have to follow health protocols to reduce the risk of COVID-19 transmission. Neglecting health protocols was also seen as having implications on future disasters, as outbreaks related to their evacuation and rescue operations might discourage people from following advisories.

4.1.2 Food

Food insecurity was already a concern when the pandemic started, with many whose livelihoods were impacted, so when the typhoons occurred, they only made matters worse

(UN OCHA, 2020d). The informant from OCD Region II shared that food insecurity is a common occurrence following events of high impact like typhoons and therefore they made sure that “*even if no donations arrived, we have prepositioned food items in Region II*”. They also shared that although a large amount of LGU funds went into the pandemic response and were depleted, it was not as much the case within Region II:

“LGUs have allocations, target statistics on the number of food items to be released per month. So, they didn't have any problems with that, maybe it was overwhelming because a lot of areas needed relief that you can't give them right away. Firstly, some areas were still inaccessible due to flooding, land travel was not possible, but these were eventually resolved...we did air dropping of relief items with the help of the Philippine Air Force. Lots of help came in from private sector and NGOs. And now the National Housing Agency (NHA) and Department of human settlements & Development has given cash assistance to people whose houses have been destroyed and the DSWD has also rolled out welfare checks to people who were victims of flooding. Aside from relief items, cash assistance is what we also give out.” – Government Agency

One informant gave the example of the event of Typhoon Haiyan. Crops are usually planted in the time period between November and February but if typhoons hit during this period and cause damages, farmers will not have any production and will have to wait until the next planting season comes, May to July, and this can have devastating effects on their livelihoods but also increase food insecurity to themselves and those they supplied. This was the reality following the impact of Typhoon Haiyan in 2013. For triple typhoons in 2020, the damage was not as severe, and crops were saved due to greater preparedness but nonetheless, the need still exists. The informant also shared that there is already thought going into how to adapt as the pandemic is lasting for a longer amount of time than expected:

“Almost everything that happens in our daily lives, we really have to be very conscious about this pandemic lingering for a longer period of time, so that is where technology comes in. EWS is part of that technology, in terms of prediction. But in terms of response, some people are already going into ultimation. We are proposing a project with KOICA for example that would allow for ultimation of production areas and the rationalizing transport system, storage system, that will allow for food banking, some form of reserve when needed so that you have a steady supply of that” – UN Agency

One informant shared that in the early recovery phase of the typhoons, they found a way to sustainably help people affected by the typhoon so that they would be guaranteed food secure through a program called ‘food for work’:

“Aside from relief augmentation, we did provide what we call the food for work program. The food for work program, we prioritize those people affected by the typhoon and those people who are also in the quarantine areas after the typhoon. So that's part of the recovery program

and services. Even up to now we still provide relief augmentation. If there are reports of people being infected of COVID or people are still in the quarantine area, we still continue to provide the relief augmentation and put food for work assistance” – Government Agency

4.1.3 Water, Sanitation, and Hygiene (WASH) and Health

The typhoons damaged critical infrastructure including water supply systems (UN OCHA, 2020c). Based on the Humanitarian Needs and Priorities Reports from UN OCHA (UN OCHA, 2020d), there were water systems that were contaminated due to flooding which hampered the hygiene activities and clean-up drives that are essential to lowering disease transmission. Hygiene kits were also in high demand due to the pandemic, and there was also an increased focus on hygiene promotion (UN OCHA, 2020d). One informant said:

“Definitely there would be more focused on hygiene promotion, and public health promotion, because we have to keep reminding people. You know, even if you're hit by a certain disaster, you have to follow the health protocol. So, this is something that can be forgotten quickly, when you are, you know, stressed you're, you're trying to look for your things, etc. You lost a family member, and you have to live in an evacuation center. So, this has to be really strict, the health protocols have to be strictly implemented. So, you would have to be stronger in reminding communities about that.” – UN Agency

Three informants also emphasized the need for mental health and psychosocial support. One informant from a government office shared that some of their coworkers tested positive for COVID-19 and that they provided psychosocial support to them. Another informant shared:

“Frontliners said that what they really need most is mental health and psychosocial support. When COVID-19 arrived, we came up with a simple program “Kamustahan sa Gitna ng Krisis” (Greeting each other in the time of crisis) in collaboration with Pasig City online. The participants included stressed, overworked individuals. For more serious mental issues, individuals would be referred to a psychologist. Smaller groups were encouraged for these psychosocial sessions, but in some cases we managed to accommodate more than usual, incorporating physical distancing, with people wearing masks and face shields” - Local NGO

4.1.4 Increased need for mental health and psychosocial support

Typically following a natural disaster, those that were affected are usually in need for mental health and psychosocial support. With the added stress of the COVID-19 pandemic, this need has been exacerbated. The UN in their Global Humanitarian Response Plan for COVID-19 (2020) raised concern on the negative effects of pandemic restrictions on mental and

psychosocial health. One of the informants interviewed shared that this has been a concerning matter, particularly for a lot of women who lost jobs and were not able to support their families any longer:

"A lot of conditions for them made them even more vulnerable so when the typhoons happened it was the one on top of the other. So, for sure the conditions made it worse. There are also quite big families, around 5, usually around 3 children in very small homes. Children don't go to school; everything is online, so children for a year have not been in school for a single day. So, losing jobs and being at home with 3 children all the time, usually women do all these activities on top of the other like homeschooling. So yes, there are lots of incidents of home related violence. The situation has made it much more dire, considering that many were already in such precarious situations prior to the typhoons" – UN Agency

The following informant's statement also agrees that this is a significant concern and also notes that lockdowns have impacted the issue of gender-based violence:

"The issue of protection is magnified. (...) The issue of gender-based violence is very high because imagine, the perpetrators stay in the house, and the children also stay home due because they don't have classes (.) And then the mother who (is earning a livelihood), would be the one to go out. Gender-based violence exploded when COVID-19 came, plus the stress with the parents, the children; it did a lot (...) We provide psychosocial support and we are trying to encourage them to share what happened and in some cases they are referred to the relevant people to whom they should talk to (...) Because of this, we have new protocols for gender-based violence and our partners are a lot more conscious about it" - Local NGO

One informant commented that what is unfolding could be considered a mental health crisis and although they don't have exact statistics, they confirm that they received their information through community reports:

"One thing that we also saw during the lockdown was that women's care work increased in the household...there's already a huge amount of stress on women and girls in particular, during lockdowns caused by the pandemic and then now these typhoons happened, they lose their assets. There's also this issue on converting classes into modular or online learning, which further adds to the burden of women because it's usually the women or the parent that teach the children now in their homes. So there have been some cases of increased suicides" – UN Agency

The NDRRMC was on Red Alert Status since the start of the pandemic and the informant shared that although there are administrative benefits to this status, there are also downsides to a prolonged red alert period:

"The same personnel were involved throughout the red alert period. There was burnout, they are already tired, they have been working like this for one year already. They first worked for COVID-19 response and also when typhoons came" - Government Agency

4.2 Response-Generated Needs

This section presents the needs resulting from the organizational response to the typhoons during the COVID-19 pandemic. While these can be more general for different kinds of disasters pre-pandemic, the emergent threat of COVID-19 imposed additional demands on those involved in the response.

4.2.1 Personal Protective Equipment

The minimum health protocols for COVID-19 according to national policies are the use of face masks and face shields. For all personnel and the general public, they had to follow these rules. The government and NGOs procured PPE for camp management and personnel, as well as for the hygiene kits that they distributed to residents and those in evacuation centers. (DSWD memo and DOH memo). Humanitarian organizations also distributed COVID-19 protection packs.

The majority of informants commented on there being a necessary change to the contents of their relief or emergency kits due to the COVID-19 policies. The main changes primarily being the addition of face masks, the face shields, and an alcohol-based hand rub. One informant mentioned that although the hygiene kits they normally provide have soap, it was vital to also include the alcohol rub as there is not always a guarantee of water being enough available at the evacuation:

"You just have to be more conscious that if people are going to be stuck in evacuation centers for a while, or the evacuation centers not having enough water, then you have to give them these alcohol-based hand rubs" – UN Agency

Two of the informants shared that they experienced difficulties in procuring PPE kits in the earlier stages of response. Due to the growing demand of PPE under the pandemic, prices had also increased as stock was not enough to meet the demand. One of the LGUs interviewed shared that the pandemic caused a shift in their usual operations:

"The budget for the COVID-19 response was a challenge because it is not planned, COVID-19 was not anticipated by anyone. So, for the preventive measures, for example, for the PPEs required for COVID-19, especially for us the local government unit we're not accustomed to this kind of pandemic for this kind of health emergencies. We are used to responding to emergencies to vehicular accidents and other common emergencies but not for pandemic. So,

for the PPEs, for that year for 2020, we did not have any PPEs prepared for response. So, we have to purchase emergency equipment as well as PPES for emergency response” - LGU

4.2.2 Testing and Quarantine Procedures

One of the main concerns with typhoon response operations under the pandemic is the risk of the virus spreading, particularly during the search and rescue. In order to avoid this from occurring, the different organizations and government units made sure that testing and quarantine procedures were established.

Multiple informants shared that their response personnel had to undergo testing and quarantine time in order to gain entry to different municipalities and that this was the same procedure following the completion of their operations in the area, and they were returning:

“Fortunately, none of us got sick coming from this deployment, because part of the adjustments for the ground deployment guidelines is that we provide testing, pre-deployment and post-deployment so that we do not bring diseases to the affected areas and we don't bring back or take home something from the field. And we also provide an isolation facility; in our case, it's a hotel stay for three days, so that you could test yourself if you develop symptoms and get tested again.” - Local NGO

“We had to make sure we were not carriers of COVID-19. We had to do pre-departure swabbing. (People who were positive) had to be removed from the team and replaced. So that's how strict the process was in identifying and organizing and putting together the different medical teams. – Government Agency

In some cases, quarantine was not required as long as the test result was negative:

“Here we follow the IATF resolutions that removed the requirement for medical certificate, but the region still respects the LGU requirements for RT-PCR tests if you're traveling to that LGU, but if you're negative you don't need to quarantine anymore for 14 days. So, it's more relaxed now because we need the economy to recover” – Government Agency

People travelling from high-risk areas for COVID-19 were also subject to testing as well as quarantine periods when moving to a different region. One of the government offices shared that there was a significant influx of individuals returning to their homes in the Bicol region from Manila due to job loss. It became an issue to accommodate all of them “so, what the local governments did, they utilized the church and other vacant buildings as their quarantine areas, even the covered courts, they utilize that also as quarantine areas and gymnasiums”. If a test came out positive, that person would be placed in a separate quarantine area to those who got a negative result.

4.2.3 Preparedness actions

Prior to typhoon landfall, responding organizations implemented preparedness measures such as Pre-disaster Risk Assessments (PDRA), dissemination of early warnings and pre-emptive evacuation (NDRRMC, 2020c). Due to the pandemic, there was an increasing shift to online means of information dissemination. The NDRRMC for instance utilized their text-blast system, as did OCD Region II who additionally made use of social media platforms:

"Right now, our Early Warning Systems are varied, we don't stick to one. Firstly, we use the most popular which is social media. Then we send memorandums to local government units, so that we can enforce the advisories. We engage radio stations, sometimes there is national media coverage. At the same time are early warning is text blasted to the region" – Government Agency

Four informants stated that their early warnings now include advisories for following health protocols and maintaining social distancing; *"if the message says to evacuate, we added the need to maintain social distancing and to follow minimum health protocols"*. Messages from the government also included advice on bringing hygiene kits with face masks and face shields, aside from bringing their usual emergency go-bag. This was part of the guidelines sent out to local authorities

4.2.4 Increasing Digital Transformation and shift to Remote Work

At the beginning of the pandemic, the IATF issued guidelines for infection control and prevention in workplaces, which included alternative work arrangements such as work from home, 50% capacity in onsite operations and alternating shifts. Many organizations shifted to online work, and their public communications increasingly relied on digital technologies and social media. However, since disaster response is an essential service, not all staff could work from home.

Although adapting to new practices such as working from home was a challenge, the implementation of skeletal workforce and alternating shifts were effective in isolating positive COVID-19 cases among staff, avoiding whole offices or teams being crippled.

"Last year we had the skeletal duty. We do have office work three times a week and then two days work from home. We observe social distancing." – Government Agency

"There was a Civil Service memorandum that said that senior citizen, pregnant women, people with comorbidities work from home. Our strategy here is that it's 50% by team. So, if someone tests positive in one team, there is a team on standby that is ready for deployment that can

replace the team that needs to be isolated... This was effective when we had a case of COVID in the office and this setup worked.” – Government Agency

Local governments also minimized interactions with the public and implemented measures within their offices to help prevent the spread of COVID-19:

“When it came to communicating physically with other offices, we had put up barriers or we put holes in windows to enable window transactions. Those were the adjustments we made, that people wouldn’t just enter the office. And the offices that always have a lot of clients that can’t be avoided, they setup offices outside so they can cater to other people. And they had plastic barriers, and of course the minimum requirement of face mask and face shield was enforced” – LGU

Informants shared the importance of building trust and that there was more trust in face-to-face interactions prior to the switch to online services. Although organization were able to switch and adjust to remote work, there are some elements of face-to-face interaction which simply cannot be replicated online. One example is the impact this has on cultural aspects. Two informants noted that Filipinos have a preference for face-to-face interactions rather than the virtual interactions. One of the UN agency informants explained this and stated that *“prior to the pandemic, a lot of things could be settled and at the same time building trust, having to see the people in front of you, talking to the people and interacting with them, adding to the personal touch”*.

The lack of face-to-face interaction also has implications for data validation and information dissemination. Misinformation for instance is a great concern as it spreads more easily through social media and therefore more effort is needed to curb and verify it. An informant from a UN agency commented that *“one of the most important pillars was response to misinformation, tracking the rumors online. It is a much greater sophistication of this kind of communication with the community at scale”*

For international humanitarian organizations, there was increased reliance on local partners. Two informants shared that they had to make use of local partners in order to carry out damage assessments due to the strict regulations. One of the informants stated that:

“There was definitely a difference in that in the pandemic, we all decided, because of the strict lockdowns that were implemented, we had to be creative in how we did needs assessments in the sense that we had to tap our current networks; so through local partners, to community-based organizations, to the LGUs we had relationships with, and use those networks to start our needs assessments. So, a lot of the needs assessments (that) have happened during the pandemic were through phone calls as much as possible. Some of them we did in messenger, Facebook Messenger, if that’s possible.” – UN Agency

The informants from a UN Agency also shared that it was a good learning experience and that having the local partners be their eyes and ears on the ground was a benefit to them even though *"local partners (are) not necessarily familiar with (how we do our) needs assessment (with the use of technology). In terms of quality, it was a mixed output but at least it gave them a feel of how a response in COVID-19 times will look like and what things they will need to watch out for"*.

This need to rely on technology in order to carry out operations and meetings virtually was also a challenge at times due to the fact that there is not always a guarantee that there will be a stable internet connection for instance. One informant shared that they used social platforms such as Zoom for meetings but that establishing a good connection was not always possible:

"Others tried getting Wi-Fi signal boosters. Those in other areas like in the Visayas, the Wi-Fi signal disappears, they had to do their meetings in the morning so there's less people using the internet. In the afternoon the signal was very weak, so we tried to do the meetings in the morning" - Local NGO

4.2.5 Access and Deployment of staff

For international organizations such as UN OCHA, it was not as easy to gain access to the affected areas as it was for the front liners and national organizations; as a way to avoid these difficulties, they worked together with the Government and came to an agreement:

"We also collaborated with the government because there was a national government led IATF. We managed to agree that in case of a humanitarian emergency, there should be access granted, but when it came down to the implementation of each local unit, we had very mixed results; some local officials allowed entry for humanitarian purposes, but some did not. But because we had all this dialogue and discussion and joint meetings before, there was a lot of trust building on both levels established so when the first typhoon Rolly happened and then Ulysses, it was much easier for us to access those areas" – UN Agency

Government institutions did not experience these issues to the same extent. When asked if they were met with any difficulties, the following responses were given:

"Not much for the accessibility as far as the quarantine level concerned. The challenges we encountered in terms of accessibility is the area where the flooding occurred tremendously very fast. Before we could penetrate those areas quickly and with anticipation that the water would rise at a certain period of time. But with the experiences we had last November, nobody expected that the flooding would occur very fast." - LGU

"This became an issue in the national media – but we didn't really have a problem with this. Actually, the problem was the influx of people who wanted to help –what we call disaster tourism. With the disaster tourism, we had an increase in the number of people and this became a problem because they could be carriers of COVID-19. As responders, we have a hub here in Region 2, and responders from other areas check-into the Region 2 response hub, the responders from Subic, Metro Manila, Mountain province, Kalinga, who want to help, when they check into our response hub, they are given permission to enter through the checkpoints."

– Government Agency

NGOs involved in disaster response are generally exempt from travel restrictions, but still needed to provide permits or documents that identified them as part of the NDRRMC.

"Those doing emergency response are considered frontliners. Others need to be approved by the IATF, at the local, regional or national levels. For us because we are members of the NDRRMC we just printed that we are members of NDRRMC (...) those who do disaster risk reduction are part of the exemptions. But for others, they ask you for a permit from the IATF. So that's an additional burden on responders. For us we were just resourceful. It just happened that our local partner is Pasig City, it was okay for them; we just informed them on where we are, what we are doing, in which barangay we're in. You just have to coordinate with the local government, I think that's really crucial to do that." - Local NGO

"We actually requested travel authority from OCD, the Office of Civil Defense, and we didn't have any difficulties entering the affected areas, because it's private vehicles, it's our trucks, it's our vans for our deployment people or for our ground team. The problems were the limited number of flights especially for these two areas, it's Bicol and Cagayan, which is it could be easily accessed through an airplane but then there are no flights or there are no commercial flights during that time. So, we had to travel by land. So that's the first difficulty, but then the airlines actually offered their services for cargo, so our relief items were air-lifted from Manila to both affected areas" - Local NGO

4.2.6 Logistics and Movement of goods

Due to the various quarantine restrictions, checkpoints were setup between different local governments to ensure that people do not travel beyond their immediate domains. While those involved in disaster response were exempted from restrictions, this still had the effect of delays with some deliveries of relief items. An informant stated that:

"Our partners reported that they had difficulties procuring WASH supplies, because they used most of them for the COVID-19 response, and as they were ordering them ahead of the typhoon season, from outside of the country, they depleted their stocks inside of the country.

The days when the supply chain was kind of broken, it was really difficult for them to get the supplies into the country” – UN Agency

When asked about supply chain disruptions, one of the respondents shared that there were not necessarily supply chain disruptions, only that there were some cases of delays in delivery:

“We had no problems in the supply chain for food items, the checkpoints didn’t really affect delivery because they have special passes. A good practice was the centralized hub where those coming from other areas you can check in and call us to tell us what you’re bringing in and how much and what your vehicle is. When you get to the checkpoint the police already knows that you can be let through because you had checked in” – Government Agency

UN OCHA situation reports for Typhoons Goni and Vamco also presented difficulties in cargo delivery *“While in transit, loaded trucks provided to support government operations are not receiving priority at seaports even if proper decals and papers are complete, resulting in delayed cargo delivery”* (UN OCHA, Situation Report No.1, 09 Dec 2020).

In some cases, organizations spoken to found that there they didn’t experience any significant supply chain disruptions:

“Manila was not really that affected by the typhoons, it’s just the logistical requirements of the supplies here in Manila to be transported to the affected areas. But after a few weeks the supplies in the affected areas are back to normal. Just like in Bicol, we actually procured most of the items in Bicol, in adjacent provinces, so I don’t think the supply chain was a problem during this disaster” - Local NGO

4.2.7 Camp Coordination and Management

At evacuation centers, evacuees were screened for symptoms of COVID-19. The DOH conducted triaging for arriving evacuees and isolated those who manifested symptoms. They also had to maintain social distancing and wear PPE. Alcohol-based hand rubs were also placed at entrances. In some areas, collapsible tents were used in evacuation centers to give separate families. In other places, they made use of classrooms and limited the number of families who could be there, in contrast to previous protocols in places like gymnasiums where evacuees could be packed together in one area. COVID-19 necessitated the need for more space due to social distancing requirements, so LGUs and government agencies had to utilize more venues to support existing evacuation centers. Due to the shift to online classes, schools were available to be used as evacuation centers.

“Since we use schools and multi-purpose covered courts as evacuation centers, there were no people in those areas so when the typhoons happened those facilities were readily available.

The only thing that was added was the minimum health standards that we observe due to COVID-19” – LGU

4.2.8 Aid distribution

With the need to maintain physical distancing, there were multiple ways in which organizations changed the way they distributed their relief assistance methods. Two organizations shared that they set up distribution schedules:

“For distributing goods, usually, times were set for queueing but now you segregate by time, letter A to C will come from 9 AM to (...) This guarantees enough space for queueing” – Local NGO

“Under the food security and agriculture cluster, we also developed a protocol for income distribution under the context of COVID-19. We schedule a small number of people daily to receive their (agricultural) inputs physically and while also observing social distancing, and wearing PPEs” - UN Agency

One informant from a local NGO shared that the distribution of good was at times also carried out at mental health sessions and that *“Sometimes relief was placed already on the seats, so no contact was needed”*. Another organization described how they employed the use of house-to-house distribution method:

“It was actually a trial and error, because initially the usual is to go house-to-house, however social distancing was not being practiced. So, for the successive distributions, we gave them tickets and they stuck those tickets outside their houses that had a chair outside. Then they’re not allowed to go out. We just placed the welfare goods on the chair and then we take the sticker, so we know that that house has already been given the welfare package. Each sticker has a code and name to ensure that all families are included. So that was our practice” – LGU

Two informants shared that in some cases, rather than providing physical goods, cash was provided as it was easier and as it could be carried out remotely, there would be less contact and therefore lowered the risk of virus transmission. An informant from a UN agency shared that they previously provided in-person assistance but that this became challenging which is why they turned to the cash distribution alternative:

“What will happen is that there is now a combination of possible assistance, the one in-kind, which is sometimes not dispensable, and now the preference for cash (...) Cash is very easy. when they receive cash, especially if this is what we call unrestricted, meaning you give the money, you allow the beneficiary to buy whatever they want to buy, because the principle is they know better, what they want most” – UN Agency

4.3.7 Funding

In terms of funding, the series of disasters had put a considerable strain on resources. With high uncertainty regarding how long the pandemic would last, the LGUs shared that they had to use up their resources to fund procurement of PPE and to give ‘ayuda’ (assistance) to their constituents either in cash or in-kind. For NGOs interviewed, funding was not necessarily impacted by either the pandemic or the typhoons. Three informants stated that because they experienced an increase in projects, the amount of funding they received through donations also increased:

“COVID-19 and typhoons did not really impact our funding since we work with disasters and we even have more projects now (...) COVID-19 relief was not enough, but when typhoons hit, more relief became available” - Local NGO

“There was also a lot of assistance coming from outside of the Humanitarian Response Plan. The private sector particularly, did a remarkable job in quickly mobilizing resources” – UN Agency

“For the funding, we actually got a significant amount of donations from our member companies and from other donors as well” - Local NGO

Three informants from regional and local offices shared that they did not struggle in terms of funding due to the activation of the Red Alert status, which gave them access to the Quick Response Fund provided by the national government. One informant stated:

“Red alert justified the use of the Quick Response Fund. Another advantage is that the law will allow for emergency procurement, allowing for stockpiling and strategic prepositioning. If not on red alert, they might need more time to prepare their resources but since they are on alert already for a long time, administratively this became an advantage as the expenses could be justified. There was a time that NDRRMC was not on red alert (...) they couldn't procure items in advance due to the restrictions.” – Government Agency

The red alert proved helpful and allowed responding national actors to carry out their operations a lot easier, particularly from an administrative perspective, to justify all the expenses. Similarly, an informant from an LGU commented on there being sufficient funds for disaster response once the state of calamity was declared:

“There were DRR funds that were diverted for COVID-19 response, the alcohol, chemicals for disinfection. However, during typhoon Ulysses, it wasn't difficult for us because we still had 30% of our DRR budget. In DRR here in the Philippines the budget is divided into 70% for the response and 30% for calamity (...) so, we still had a reserve budget of 30% so it wasn't so

difficult when Typhoon Ulysses arrived. In fact, we were able to distribute relief goods 7 times, plus there were a lot of donations that came in” – LGU

However, it cannot be denied that funding resources had also been strained. Two informants from the government also mentioned issues with depleted funding. The informant stated that the LGUs funding had been depleted “*because during the first and second quarters of 2020 poured their local DRRM funds into COVID response, such as giving relief items to barangays on lockdown; welfare checks to people who couldn’t go out due to ECQ, so at the end they were really depending on national government*”. The other informant shared that due to the stricter rules on budget release, there had to be some prioritization in order to proceed most efficiently:

“The government has lots of priorities in terms of COVID-19. On the part of the Coast Guard, the priority now is fuel and logistical requirements to sustain the deployment and response to any maritime incident. Even the Coast Guard at the airport, like the food of the troops, we need to maintain this. Because the troops need to be well-supported, the food, their vehicles, the ships, we cannot neglect our personnel’s food” – Government Agency

One informant also shared that the scale of needs became a lot more severe due to multiple hazards:

“The COVID humanitarian response plan was the largest appeal since Haiyan and on top of it, asking additionally for 50 million because of the typhoon response. It put a burden on our usual donors because they themselves were affected” - UN Agency

The PDRF also shared this sentiment, stating that “*donor fatigue*” is one of their concerns because of how long the pandemic is lasting:

“The private sector donated a lot of money to feed about 15 million people if I can recall the number correctly, but it was a large amount of money, and then the pandemic went on and it was actually a prolonged response to COVID-19. So, after the feeding program, they had to donate for the PPEs for the public hospitals, for the meals of the front liners. So there, there was ongoing relief operations, response operations for COVID-19 and then the typhoons struck the most” - Local NGO

4.5 Impact of Typhoon Disasters on Pandemic Situation

While the pandemic affected the way disaster operations were run, the effects of the typhoons also disrupted COVID-19 pandemic response operations. In some of the areas affected, hospitals and testing centers had been damaged by the typhoons. Reports from NDRRMC regarding Typhoon Goni showed that 178 COVID-19 patients and 417 medical and

support staff had to be evacuated from 11 facilities due to the typhoon (NDRRMC, 2020c). According to informants from Cagayan Region, they also had to evacuate quarantine facilities affected by flooding after Typhoon Vamco, moving them to other facilities on safer ground. Precautionary measures needed to be taken in transporting patients, with responders wearing full PPE.

Informants were also asked if the damages caused by the typhoons affected the transmission of the virus. Before the arrival of the typhoons, there was already concern on the part of government and humanitarian organizations about how to avoid transmission of COVID-19 in disaster response operations when physical interactions cannot be avoided. This can be seen in the memorandums regarding preparedness updates issued by government authorities as early as May 2020 (DILG, 2020) and as reported by UN OCHA (UN News, 2020). As evacuation of many individuals had to be transported before the typhoons made landfall, that there could be a possibility of COVID-19 outbreaks occurring during the search and rescue period, as well as within the evacuation shelters. However, according to all of the informants involved in ground operations, they did not receive any reports of outbreaks directly related to typhoon disaster response operations.

A comparison of COVID-19 case numbers before and after the typhoons in three provinces based on the official case tracker from the DOH also show no significant increase in cases (see Appendix A). According to representatives from these regions, they also did not see outbreaks related to the response operations, only individual cases. It should be noted that the areas that were most severely affected by the three typhoons of this study were primarily rural areas and not very densely populated. In these regions, the number of COVID-19 cases is not as high as in major metropolitan areas like Metro Manila in the National Capital Region which also get majority of the country's air traffic. According to news reports, there were some evacuees that were screened and tested for COVID-19 in cities in Metro Manila and were immediately isolated (Gonzales, 2020; Aguilari, 2020). Even within Rizal Province, informants stated that the areas that were flooded were far from urban centers. All of these factors and the adherence to minimum health protocols such as social distancing and wearing of face mask and face shields may have helped in keeping COVID-19 case numbers low in these areas despite the gathering of people in evacuation centers and relief distribution areas.

4.6 Policy Updates After COVID-19

Policies set the direction of disaster risk management; thus, it is important to examine how these have been updated to reflect the demands brought by the pandemic. The majority of the informants shared that when the pandemic started, there was a need to make adjustments to plans and policies. The UN released the Global Humanitarian Response Plan for COVID-19 in March 2020, which included guidance for the response to the pandemic, and was continuously updated throughout the year (UN OCHA, 2020b). On March 29, 2021, the

NDRRMC in the Philippines published the new Disaster Risk Reduction and Management Plan for 2020-2030 which includes lessons from the COVID-19 pandemic, including the need to invest in public health reform for a more effective response to health emergencies (NDRRMC, 2021). It also highlights accelerated use of digital technologies and media during the pandemic, and the importance of maximizing the proper use of social media for information dissemination and early warnings (NDRRMC, 2021). The NDRRMC also issued guidelines in December 2020 for disaster response operations simultaneous with COVID-19 response, which included additional responsibilities for cluster leads as they respond to disasters during the pandemic. Other respondents also created updates to their own internal plans.

The COVID-19 pandemic has also led to an increase of interest in moving away from a primarily reactive approach and investing more in preparedness. One informant shared that: *"There is an increasing appetite to invest in more of this anticipatory, risk management approaches. Taking early action element, rather than wait"*. The benefit of investing in preparatory action rather than reactive, especially for hazards such as typhoons which are impossible to mitigate, is that the damages in the aftermath of a hazard can be minimized. Another informant commented that there is an overall need to better prepare for hazards, especially complex ones such as the typhoon amid the pandemic: *"We should plan for what we call complex emergencies because a lot of our plans for both the private sector and the government are for individual hazards. We have contingency plans for earthquakes we have contingency plans for typhoons, but then we were hit by a couple of typhoons and a pandemic"*.

4.7 Summary of COVID-19 Pandemic Impacts on Disaster Response Operations

Table 3 shows the effects on COVID-19 interventions on the typhoon response operations by the participating organizations and the subsequent adjustments that they made to adapt to the pandemic.

Table 3. Impact of COVID-19 Pandemic on Disaster Response Operations and Adjustments Made by Participating Organizations

	COVID-19 Effects	Disaster Response Adjustments
Monitoring	Physical monitoring limited due to mobility restrictions	Maximization of digital technology
Early warnings	Need to incorporate health safety guidelines, decreased face-to-face communications	Shift to more digital means of communications

Pre-disaster Risk Assessments	Physical distancing required	Virtual meetings for NDRRMC
Post-disaster Damage & Needs Assessments	Unable to conduct assessments in the field due to restrictions	Increased reliance on local partners
Evacuation Process	Physical distancing required	Limits on number of people per vehicle, prolonged pre-emptive evacuation process
Search & Rescue	Protective measures needed to prevent spreading virus during rescue missions	Added use of PPE
Camp Coordination & Management	Physical distancing required, Increased availability of schools in some areas due to online classes but in some cases, these were being used as quarantine facilities	Spacing within centers, use of collapsible tents, decreased capacity due to physical distancing requirements
Relief Distribution	Physical distancing required	Physical distancing and sanitation stations implemented Scheduling in shifts, house-to-house distribution
Health & Wash	More frequent handwashing needed	Triaging and rapid testing of evacuees, isolation of those with symptoms, distribution of face masks, face shields, alcohol-based hand sanitizer
Communications	Decreased face-to-face interactions due to physical distancing	Shift to paperless communications, virtual meetings; increased use of digital technologies for both internal communications and

		public information dissemination
Travel/Movement/Deployment	Restricted movement, border closures and checkpoints implemented, decreased transport options	Increased reliance on local partners; centralized hubs for responders and donors Exemptions for disaster responders and humanitarian workers
Funding	Additional funding needed for COVID-19 measures	Separate government funds activated for COVID-19 response Usage of DRM funds for procurement of PPE Increase in COVID-19 related projects Influx of donations
Staff Resources	Impacted staff availability –permitted capacity in office spaces reduced to reduce risk of spread of virus	Skeletal workforce, others on work from home arrangement
Early Recovery Actions	Prolonged recovery time expected	–

Chapter 5: Discussion

This chapter will discuss the results and relate findings to available literature. COVID-19 impacted multiple aspects of disaster risk management, and based on the interviews and document analysis, several themes emerged that may serve as important lessons crisis managers. These are, (1) flexibility in response (2) balancing COVID-19 needs with typhoon needs (3) Importance of preparing for multi-hazard scenarios (4) Implications of multiple hazards on recovery.

5.1 Flexibility in response

Results from the interviews show that respondents often mentioned the need to be creative and innovative in the way they adjusted their operations to the pandemic. In order to deal with new, emergent threats such as COVID-19 in the future, there is a need for flexibility in response. Flexibility has long been emphasized as important disaster response especially for large-scale events (Webb & Chevreau, 2006). Being able to adapt in the face of high uncertainty is key for dealing with emergent risks, and “successful responses to crises occur not in spite of but because of various unscripted activities, improvised behaviours, and emergent organisational structures” (Webb & Chevreau, 2006, p. 67). This was seen in how disaster responders and humanitarian actors implemented their aid distribution processes, making use of various methods such as scheduling recipients in batches or shifts and house-to-house deliveries in order to comply with COVID-19 guidelines of limiting gatherings and enforcing social distancing. Since the beginning of the pandemic, they have also been continuously adjusting policies to incorporate lessons learned. When faced with mobility restrictions and inability to conduct face-to-face operations, participating organizations detailed how they maximized use of digital technologies for remote work and how they relied on local partners for data collection. This leads to the next point, which is the importance of local participation in disaster risk management.

Localization has been highlighted in the Grand Bargain, the 2016 agreement signed humanitarian actors that recognized participation by local actors as key to effective humanitarian action and committed support to localization initiatives. With closure of international borders and even regional travel restricted, COVID-19 has disrupted these global networks of humanitarian actors and the role of local actors is more important than ever. This was also recognized by the International Council of Voluntary Agencies in a statement on the Grand Bargain, which highlighted the need to accelerate localization (ICVA, 2020). In this study it was found that there are still gaps that must be filled when it comes to the capacity of local actors from the municipal level down to the *barangay* or village level to respond to an event as complex as COVID-19 compounded by other hazards, with informants from LGUs stating that they were not used to this kind of emergency. The pandemic provides the opportunity to address such gaps through capacity development, with emphasis on local ownership.

5.2 Balancing COVID-19 Needs with Typhoon Needs

Prior to the typhoon disaster events described in this study, emergency responders had already raised concerns regarding incompatibilities between common COVID-19 interventions and that of disaster response operation (Shultz et al., 2020). This was apparent in the evacuation process as pointed out by Shultz et al. (2020), where gathering people in evacuation shelters runs counter to the physical distancing guidelines imposed during the COVID-19 guidelines. From this study it was found that these apparent incompatibilities were managed through the adjustments mentioned in the previous section. While the evacuation process may have been prolonged and more shelters were needed, these were deemed as necessary to manage COVID-19 transmission. Such changes implemented by the different organizations appear to have been successful at preventing further loss of life as there were no reported outbreaks related to evacuation shelters. Encouraging people to evacuate was already a difficult task even before the pandemic. A common reason brought up is that people do not want to leave their homes because they want to stay behind to protect their property. There might also be confusion regarding where and when to evacuate. People with disabilities also find it difficult to evacuate with assistance. With the COVID-19 pandemic, these challenges and risks that people need to consider when evacuating also increases (Das et al., 2021) therefore, it is essential that the evacuation process is done successfully following the health protocols, to avoid discouraging people from evacuating in future events. This was deemed as crucial to maintain the trust of the public. Mishra (1996) discussed the multidimensional nature of trust in crisis response, which involves competence, concern, openness and willingness to be vulnerable. In this case, the disaster responders were clearly concerned for their constituents while also ensuring their ability to manage the pandemic, which has important implications for future disasters as loss of trust in their competence could result in difficulties getting the public to follow guidelines, i.e., they would be unwilling to be vulnerable to authorities.

The issue of balancing COVID-19 needs with disaster operations was also highlighted when discussing the search and rescue process. The emergency response and humanitarian contexts are characterized by urgency and uncertainty, and decisions that can have large consequences need to be made under immense time pressure. (Knox Clarke & Campbell, 2020) When lives are at stake, saving them becomes the priority ; there cannot be a delay due to the COVID-19 regulations that were put in place. While respondents said they try to prioritize both risks, this instance shows the shifting priorities when it comes to saving lives, where the more immediate danger-in this case escaping from the floods- needed to be dealt with right away and COVID-19 restrictions were no longer strictly followed. This is in line with Janzwood (2020, p.5) where it was stated that “concerns about immediate personal safety will tend to trump those about physical distancing”.

5.3 Recognizing compound risks

As described in Section 2.2, compound risk is when two or more threats occur at the same time. In this case, the intersection of the COVID-19 pandemic with natural hazards is an example of compound risks. Such a situation was very new to the informants, who felt that that this situation was unexpected and that there was suddenly the need to make alterations to not only their daily lives, but also to the way in which they carry out their on-site work and disaster response operations. One study looking into the societal vulnerabilities under the COVID-19 pandemic stated that the “possibility of surprises should be taken into account i.e., the encounter with unknown unknowns” (De Marchi, 2020, p. 168). There are an increasing number of studies looking into cascading, compound, interacting and interconnected risks. Pescaroli & Alexander (2018) for instance, propose that a holistic framework be used when working with such complex scenarios, in order to gain “a better visualization and understanding of high-impact events” (Pescaroli & Alexander, 2018, p. 22). The use of a systems approach is useful in visualizing the interplay of different events. Sahin et al., (2020) used a systems lens to create a causal loop diagram (CLD) to visualize the complexity of the COVID-19 pandemic the subsequent effects that pandemic control interventions had across socio-health-economic-environmental boundaries. It was used by Berariu et al. (2015) to study the effect of a disaster on relief operations, with a focus on how disaster impacts to critical infrastructure can create a reinforcing feedback loop on the ability to conduct disaster mitigation measures. Zaidi (2018) also used a systems approach to create causal loop diagrams based on multiple case studies of heat wave events, which is useful for showing the cascading effects of slow-onset, small-scale disasters.

By applying a similar method to this case study, the interactions between elements of disaster response operations and the COVID-19 pandemic response can be identified in the diagram presented in Figure 4. To create the causal loop diagram in Figure 4, variables from these previous studies and from the summary of impacts in Table 3 are used as inputs. It should be noted that a limitation of causal loop diagrams is a high level of aggregation, thus not all variables can be included in the diagram, especially if they are unique to a region (Berariu et al., 2015). This diagram was created with the intention of portraying the relationships between different variables. It is important to note that it is case specific—the diagram is built on data collected from the context of this case study. Correlation does not necessarily imply causation, meaning that if one variable led to another in this particular example, the same pathway is not a guaranteed in a different context. Zaidi (2018) shares this view in that it is not enough to simply rely on the data of a single event to find the correlation and causation. This diagram should be viewed merely an example of how the researchers have interpreted the findings of their study and have chosen to present it such that the reader may clearer impression of complexity brought forth when dealing with multiple hazards.

In causal loop diagrams, a minus sign (-) indicates that the first element subtracts from the next, i.e., it has a negative impact on the succeeding element, e.g., the typhoons damaged

infrastructure, resulting in less availability. The plus (+) sign indicates that the first element adds to the next, or that they change in the same direction. An example of this in this case study is that the intervention increased the availability of a resource, e.g., the closure of schools provided more venues for evacuation shelters.

In Figure 4, the diagram begins with COVID-19 interventions similar to what as (Sahin et al., 2020) had done in their COVID-19 causal loop diagram. The interventions include movement restrictions, business restrictions, which affected the mobilization of staff, the stability of the supply chain (FAO, 2021), thereby affecting camp coordination and aid distribution. Regarding funding, the declaration of a State of Calamity allowed municipalities and agencies the use of Quick Response funds, which allowed them to procure items and implement measures to address COVID-19 infection prevention and control. Regarding the impacts of the typhoons, variables are taken from Berariu et al., (2015), whose diagram included the impact of a disaster and its effects on critical infrastructure such as transportation networks, water systems, power, and communication lines, which then affect the availability relief units and the conduct of disaster management measures. These variables are also applicable in this case study of typhoon impacts. The “Damaged Houses” and the succeeding “Evacuation” is from the CLD of Scheer (2021), and here Search and Rescue is included with evacuation, as the impacts based on this cases are similar in both processes. The typhoons and the floods caused the need to evacuate, and COVID-19 protocols on physical distancing, limits on number of people and obligatory PPE created obstacles in this process. In Janzwood (2020), he also used a systems lens to create a model of the effects of COVID-19 mitigation strategies on evacuations during a wildfire event. He found that transportation, emergency shelters, and the merging of households are three components in the evacuation process pose a risk of COVID-19 transmission; and evacuation strategies must be modified to address these (Janzwood, 2020). In the present study, it was found that evacuation strategies employed to address transportation was the implementation of limits on the number of people per vehicle. Limits on number of people were also followed for evacuation shelters to be able to follow physical distancing guidelines. In Potutan and Arakida’s (2021) study on evolving disaster practices amid the COVID-19 pandemic, dispersed evacuation methods were among their main findings as having been implemented in several disaster response operations. SPHERE criteria for humanitarian operations have a standard of a minimum area of 3.5m² for each evacuee, but with physical distancing guidelines, this increases to 6m² (Potutan & Arakida, 2021). According to the present study’s informants, they also followed physical distancing guidelines for shelters, which resulted in decreased capacity per shelter and an increased number of shelters needed. In some areas, due to school closures, this was readily implemented since students were not using school premises. However, some schools were also being used as quarantine facilities, so the overall impact of school closures was balanced.

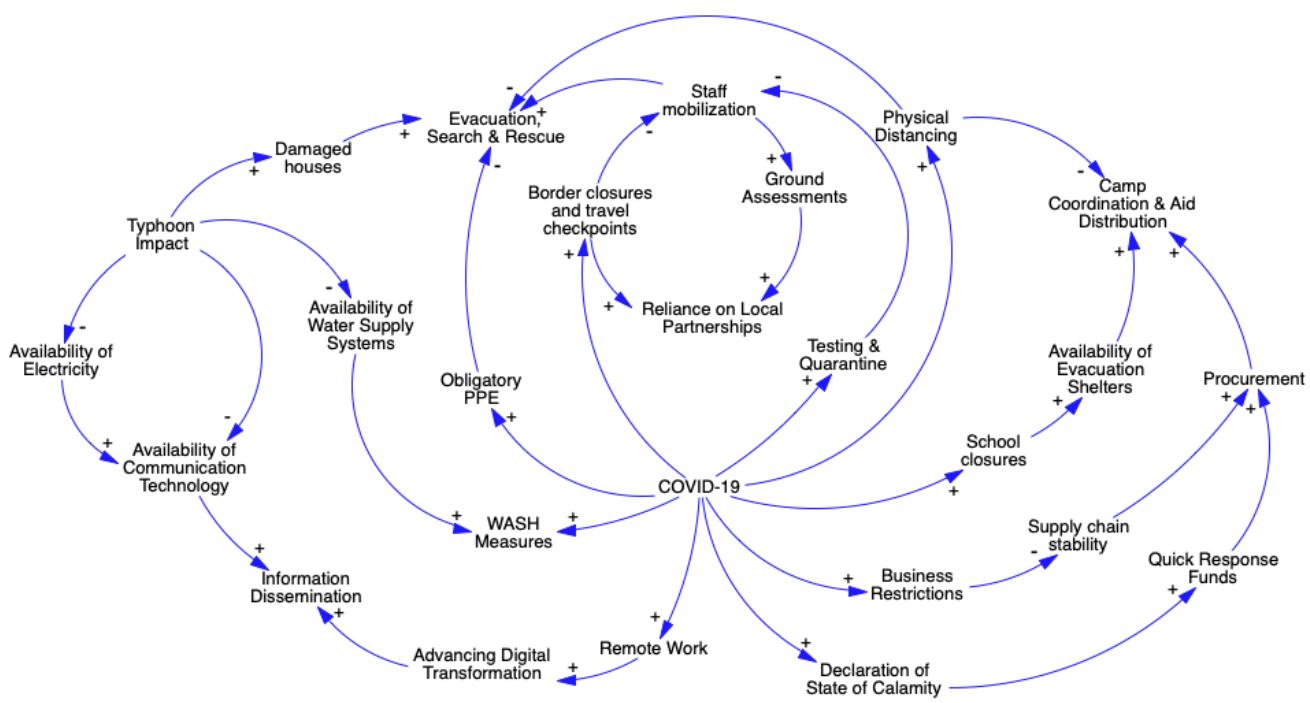


Figure 4. Causal Loop Diagram showing the impact of COVID-19 interventions on disaster response operations

The results also show that due to the COVID-19 pandemic, there has been a rapid increase in the use of digital means in response operations due to the restrictions in place. One report also recognized a similar shift, stating that they noted that the impact of the concurrent hazards has especially accelerated the use of digital technology for several services such as early warning systems, surveillance and also impact assessment (Potutan & Arakida, 2021). Increased reliance on digital technology can also result in negative outcomes. During humanitarian crises, often times, there is a need for a lot of information in a short amount of time which can generate misinformation or fake news (Tran, et al., 2020). A majority of the informants mentioned that many people turn to social media as a source of information rather than official sources, and that they had to take measures to combat misinformation. Tran et al. (2020) suggests that the reason for the focus on social media is that it tends to provide information at a faster rate than official sources.

Planning for complex disasters can be a challenge and can create the need to build cascading risk scenarios which means it is essential to include as many of the possible threats. The diagram in Figure 4 helps identify how the COVID-19 pandemic response intersected with typhoon disaster response operations and the additional impacts these created, whether positive or negative. The adjustments implemented to address these impacts were also discussed in this study and may help in preparing for future scenarios. After the series of typhoons occurred amidst the pandemic, updates were made to DRRM plans to highlight biological hazards and invest in health systems. There were also changes made to the cluster system following the start of the pandemic, with the NDRRMC publishing guidelines for disasters occurring simultaneously with COVID-19. It should be noted that it is impossible to

consider all threats and uncertainty will always be present (De Marchi, 2020); that “reality doesn’t stand still and the future that we try to foresee doesn’t exist out there to be discovered, but is constantly shaped and reshaped by the combination of events to tally out of our control” (De Marchi, 2020, p. 168). In the case of this study, the incorporation of the effects of both biological hazards such as the COVID-19 virus and the natural hazards like the typhoons were highlighted as vital—it is important to invest in preparedness for emergent risks.

5.4 Implications of compound risks on recovery

The results have shown that due to the extent of the damage created by both the pandemic and the typhoons, recovery periods may be longer than usual. This is because of how the COVID-19 pandemic has impacted so many levels of society and still continues to modify the way people live their daily lives.

Mental health and psychosocial issues was one of the concerns brought forth during the interviews and from the document analysis. The effects of both types of hazards has impacted not only the typhoon victims, but also the response workers involved in disaster response operations. Lockdowns can lead to loss of livelihoods or financial difficulties (UN OCHA, 2020b), as well as isolation for those in areas with strict stay-at-home orders. This has resulted in an increase in mental health issue cases and coincides with what was observed in a similar study by Simonovic, Kundzewicz, & Wright (2021) where they state that mental health challenges are likely to be impacted in that they can lead to long-term implications and can significantly make matters such as domestic violence worse. Staff at the participating organizations have been working remotely for more than a year now and the general sentiment is that it has been a difficult adjustment; office working environment and dynamics are greatly missed. Some organizations started providing mental health sessions to workers as a form of support to help them cope and move forward. The results show that emotional support has proven to be vital, particularly during and following these disasters (De Marchi, 2020); and that staff have been genuinely grateful for the sessions. Support systems have been useful especially since the pandemic is such a new and unfamiliar type of threat for everyone; the pandemic created the need for rapid adaptation to something “previously difficult even to imagine” (De Marchi, 2020, p. 169).

The interviews also provided some insight to how the loss of livelihoods is a significant concern amongst households especially due to the loss of jobs. Many Filipinos have had to return home from abroad due to the pandemic which meant that their families who were benefitting from their remittances can no longer do so. The farming communities in the typhoon affected areas are another example: the damage caused by the typhoons has impacted their livelihoods as crops were destroyed. These hazards have thereby produced a higher rate of dependency with people in greater need of financial support. Financial aid is perhaps good for the immediate needs, but it is in no way a long-term solution. From the interviews it was found

that this was a reason for proposing a more sustainable option such as the 'Food for Work' project which is meant to provide food security.

Chapter 6: Conclusion

COVID-19 is a complex disaster that has affected multiple sectors of society including disaster risk management. In the context of typhoon disaster response, it created an additional set of needs that responders had to address. Restrictions implemented by the government for infection prevention and control also added an additional layer of complexity to the disaster response operations. Limits on local and international travel, physical distancing and quarantine requirements affected the mobility of populations, including those involved in the response to the typhoons. The interaction of COVID-19 impacts with elements of another disaster, plus the addition of restrictions which affect response, all pose risks to exacerbating disaster outcomes. In terms of the immediate effect on loss of life, it is hard to quantify how such interventions could have resulted in either increased or decreased casualties. What is clear is that COVID-19 has had a severe impact on multiple aspects of human life, and that the arrival of multiple typhoons has made people who were already vulnerable from the socio-economic impacts of the pandemic worse off.

The results in this study show that there had to be significant changes implemented to existing protocol; health safety regulations had to be incorporated at all stages of the typhoon response operations as a precaution in order to curb the spread of the pandemic. There was a major shift in work method, primarily in terms of physical distancing and the use of PPE. Majority of the organizations switched to remote work and increased their reliance on digital technology to carry out their tasks as working in the office was not a possibility. Restrictions on movement around the country was another challenge created to prevent further spreading of the virus, with informants sharing that this created some delays in terms of aid distribution. Informants shared that these restrictions also created problems for them when they needed to carry out the needs assessments. There was an increased reliance on local partners as some organizations were unable to be deployed in the field. When it came to aid distribution, different methods were utilized. While school closures due to the pandemic had opened up campuses as evacuation centers, the shelter capacity was also reduced due to the physical distancing measures. These results serve as an example of how unprecedented events of this scale have affected response operations in one real life context and may be used to inform decision-makers on the type of considerations that need to be made when faced with concurrent hazards. It is important to note that some results will be context specific and therefore not directly applicable to other contexts, i.e., differing culture dynamics.

When intersecting with other hazards, such as the series of typhoons described in this study, it creates the need for a more robust multi-hazard approach. What makes the consideration of a multi-hazard approach important, is that concurrent hazards are likely to become more

frequent and of greater magnitude in the future due to the impacts of climate change. Population growth is another factor which is likely to contribute to an increase in vulnerability of people to hazards. Emergent threats similar to COVID-19 may continue to appear in the future, therefore preparing for multi-hazard scenarios is essential as it allows for increased flexibility and leaves room for adaptation during operations.

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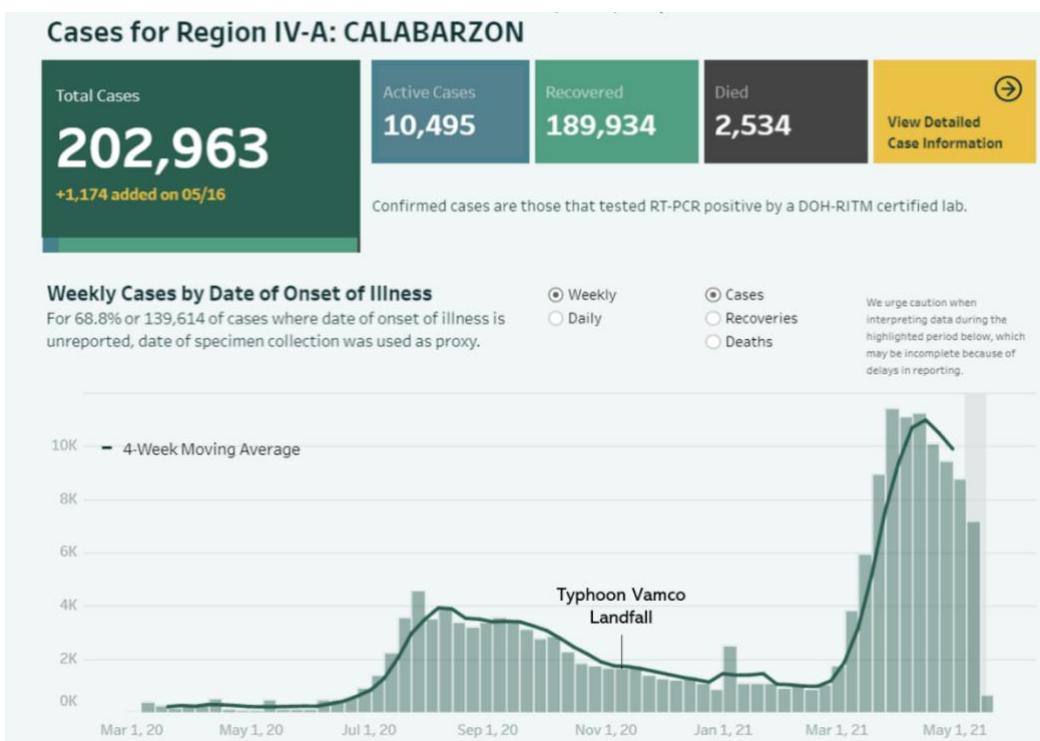
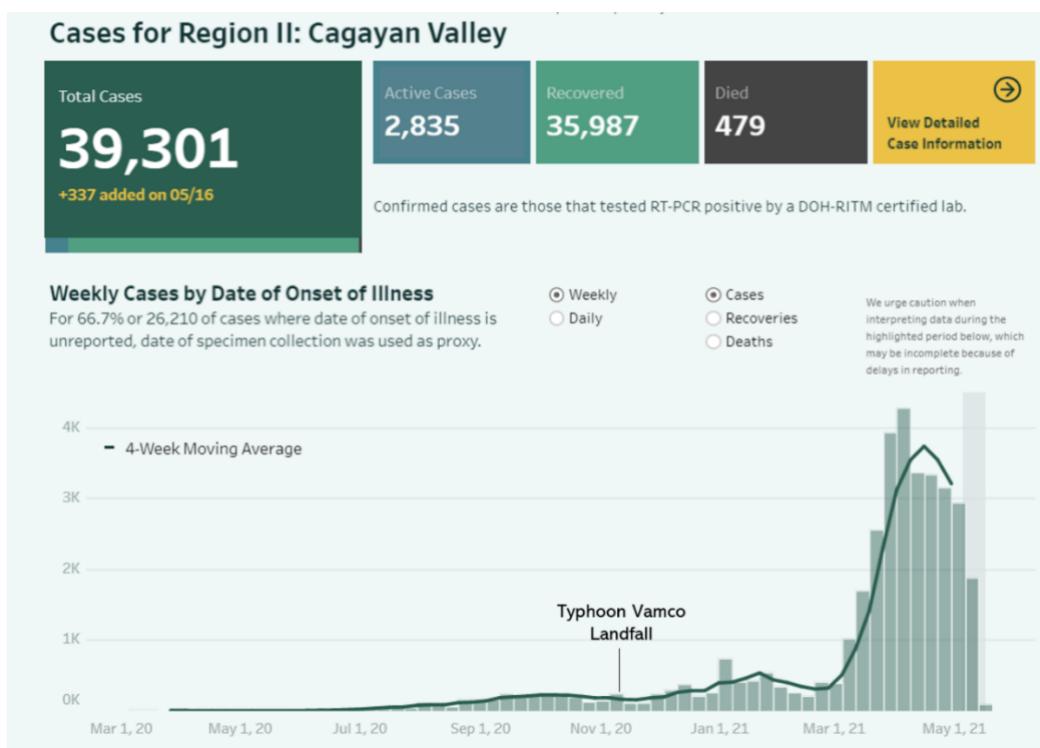
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Appendix A: COVID-19 Cases in Study Areas



Cases for Region V: Bicol Region

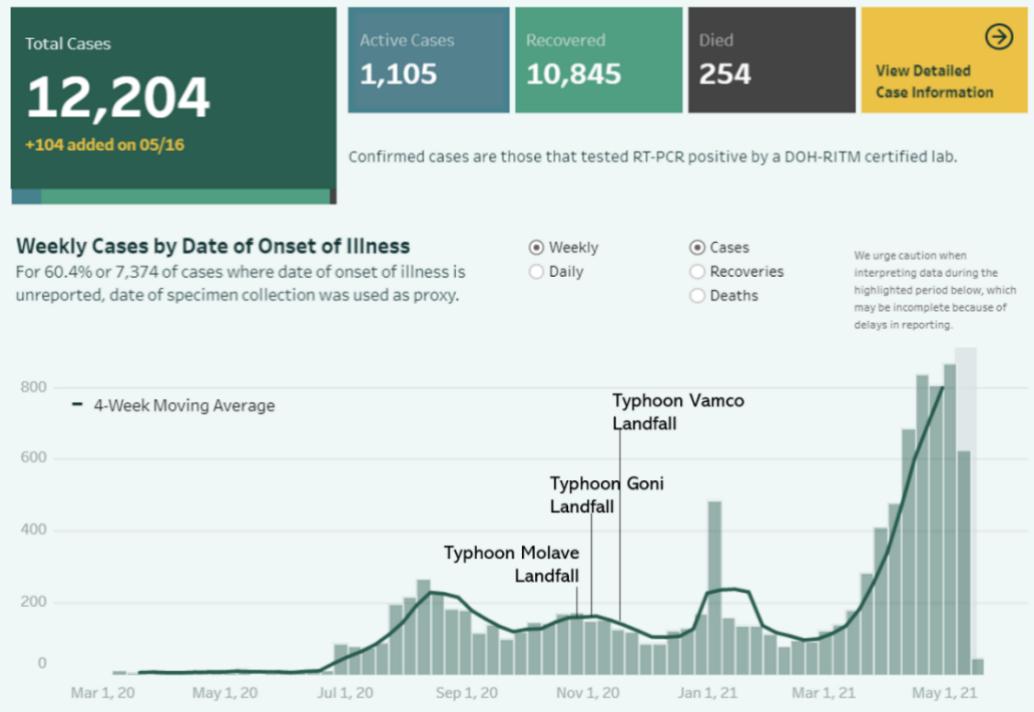


Figure 7. COVID-19 Cases in Region V (Bicol Region). Source: DOH COVID-19 Tracker

Appendix B: Interview Guide

Typhoon Preparedness

1. How did you adapt your typhoon disaster preparedness efforts in accordance with COVID-19 guidelines? In terms of:
 - a. Contingency planning
 - b. Needs & Damage assessments
 - c. Prepositioning of supplies

Access and Communications

2. Did the COVID-19 travel restrictions cause any difficulties for staff in accessing areas affected by the typhoons?
3. How did the pandemic impact your internal and external communications? Did it affect coordination?

Resources

4. What was the impact of these overlapping crises on the availability of funding?
5. In terms of resource/budget allocation, how did you balance typhoon disaster needs with COVID-19 needs?

Search & Rescue, Evacuation

6. What COVID-19 protocols were put in place for the evacuation and search & rescue processes?
7. How did you balance the need for evacuation against the risk of increasing disease transmission?

Relief Assistance

8. Were there any changes to the contents of relief packs that you distribute?
9. How was the relief assistance implemented to comply with COVID-19 guidelines?
10. Were there any COVID-19 outbreaks linked to typhoon response operations?

Health and WASH

11. Did the typhoons impact pandemic response? E.g., in terms of capacity, damages to facilities, need to evacuate
12. Were there changes to WASH guidelines in your operations?

Summary

13. What learnings have you gained from your experience with the consecutive typhoons combined with the pandemic restrictions?

Appendix C: Interview Consent Form

Title of Study: Typhoon Disaster Response amid the COVID-19 Pandemic: The Case of the Philippines During Typhoons Molave, Goni, and Vamco (2020)

Description of Project: This study seeks to understand the interplay between two kinds of crises—a major typhoon and a pandemic—and how one can address emergencies which might have competing needs. It employs a collective case study approach that analyzes how the Philippine government and humanitarian organizations responded to the typhoons amid the COVID-19 pandemic. Themes such as disaster coordination, communications, logistical access, search and rescue, aid distribution, water, sanitation, and hygiene (WASH), and emergency shelter management are explored in this study. With no foreseeable end to the current pandemic and the 2021 Pacific typhoon season beginning, we hope that the knowledge acquired through this research can help inform disaster response managers on how to better prepare for future overlapping disasters.

Duration of Project: January to May 2021

This consent form is to ensure that the participant understands the purpose of their involvement and the conditions of their participation. If you agree to be interviewed as part of the above research project, please read the information outlined below and sign this form to certify that you approve the following:

- The interview will be recorded for data analysis purposes and will not be used outside of this research.
- Interviews will be transcribed and processed using qualitative data analysis software.
- Data collected from interviews will be kept confidential and only the researchers will have access to the data.
- The actual recordings will be deleted after the project ends.
- The names of participants will not be disclosed and only organization names will be identified in the study.
- Direct quotes may be used in the study but will be anonymized.
- Participation is voluntary and the participant has the right to decline to answer any question or to withdraw from the project.
- The thesis will be only published in Lund University's student theses database (LUP Student Papers).

Name of Participant	Signature	Date
Name of Researcher	Signature	Date