

Community health worker contributions to climate resilient health systems: A qualitative study of how community health workers navigate extreme weather events in the Philippines

Bridget Beggs^a, Laura Jane Brubacher^a, Monica Bustos^a, Lincoln Lau^{a,b,c}, Jennifer Liu^{a,d}, Warren Dodd^{a,*} 

^a School of Public Health Sciences, University of Waterloo, 200 University Ave. West, Waterloo, Ontario N2L 3G1, Canada

^b International Care Ministries, Unit 1701, 17th Floor, West Tower, Philippine Stock Exchange Centre, Exchange Road, Ortigas Center, Pasig City, Metro Manila 1605, Philippines

^c Dalla Lana School of Public Health, University of Toronto, 155 College St., Toronto, Ontario M5T 3M7, Canada

^d Department of Anthropology, University of Waterloo, 200 University Ave. West, Waterloo, Ontario N2L 3G1, Canada

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ABSTRACT

Community health workers (CHWs) are an important source of health-related support and care across many resource-constrained settings. However, amid the increasing frequency and intensity of extreme weather events globally, there is a need to understand how CHWs may experience and navigate these events, and consider potential opportunities to strengthen their contributions to climate resilient health systems. This study explored the experiences of CHWs before, during, and after extreme weather events to examine how their identities, existing responsibilities, and perceived capacity shaped their ability to contribute towards preparedness, response, and recovery efforts in their communities. In collaboration with a Philippines-based non-governmental organization (NGO), we conducted 51 semi-structured interviews with CHWs affiliated with an NGO-led CHW program across four municipalities in Negros Oriental, Philippines. All interviews were audio-recorded, transcribed, and thematically analyzed using a hybrid deductive-inductive approach. Participants described how the various roles and responsibilities they held within and outside of their household shaped their engagement with preparedness, response, and recovery to extreme weather events. Importantly, participants highlighted opportunities to enhance their contributions to preparedness, response, and recovery efforts in their communities. Further, participants discussed how additional training and material resources could be leveraged to enhance preparedness to and recovery from extreme weather events in their communities. Overall, this study provides insight into how CHWs may contribute to climate resilient health systems amid extreme weather events, and underscores the complexities of recognizing CHWs as both health leaders and community members in disaster risk management practices.

1. Introduction

Community-based actors are key contributors to building climate resilient health systems to address the impacts of extreme weather events. As outlined by the WHO, a climate resilient health system is one that is able to “anticipate, respond to, cope with, recover from, and adapt to climate-related shocks and stress, so as to bring sustained improvements in population health, despite an unstable climate” (World Health Organization, 2015). Existing climate resilience literature highlights a need to expand traditional systems of healthcare delivery and

strengthen the capacity of health systems to create sustainable disaster risk management processes (World Health Organization, 2015, 2019; Mosadeghrad et al., 2023). Disaster risk management, which aims to reduce or mitigate the negative impacts of disasters, focuses on comprehensive strategies that often rely on the cooperation of numerous stakeholders, including those at the local level (Coppola, 2015; Rajabi et al., 2022). As such, health systems that recognize communities as not simply recipients of care, but as central actors to the health system, may strengthen disaster risk management and support community resilience to climate change (Abunyewah et al., 2020; Kruk et al., 2015).

* Corresponding author.

E-mail address: wdodd@uwaterloo.ca (W. Dodd).

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Supported by the WHO building blocks for climate resilient systems, community-based health systems act as a foundation for broader climate resilient health systems (World Health Organization, 2015; Kruk et al., 2015; Haldane et al., 2022; Wei et al., 2022). Thus, building the capacity of local health actors and including communities in planning and action may meaningfully contribute to more climate resilient health systems (World Health Organization, 2019). One avenue to strengthen community contributions to climate resilient health systems is the increased expansion of and investment in community health worker programs (Domingo et al., 2024; Siekmans et al., 2017). Community health workers (CHWs) are lay members of a community who either volunteer or work within a government health system or through a non-governmental organization (NGO) (Mallari et al., 2020; Dodd et al., 2025). CHWs may deliver basic treatments, make referrals to formal health services, provide health-related education, and/or provide psychosocial support within their communities (Glenton et al., 2021). As members of the communities they serve, CHWs often hold relationships and trust with community members and can deliver culturally and contextually appropriate care (Mallari et al., 2020; Kane et al., 2020; Luu et al., 2022; Dodd et al., 2025). With an increasing recognition of the critical role that CHWs hold within health systems (Kane et al., 2020; Carson et al., 2022), there may be opportunities to further leverage their support when managing extreme weather events, thereby strengthening disaster risk management and enhancing community contributions to climate resilient health systems (Domingo et al., 2024; Nicholls et al., 2017; Palafox et al., 2021). With the increasing frequency and severity of extreme weather events, and their disproportionate impact on low- and middle-income countries, community contributions to climate resilient health systems may be increasingly relied upon to mitigate the health consequences of climate-related disasters.

Despite the potential contributions of CHWs to climate resilient health systems, they may be subject to the same personal challenges as other members of the community during extreme weather events. Though previous research has described the contributions of CHWs in preparing for and responding to extreme weather events (Nicholls et al., 2017; Maat et al., 2021; Shah et al., 2019), there is limited understanding of how the multiple identities and roles held by CHWs, including as both health leaders and as community members, may influence their experiences, capacity, and responsibilities amid extreme weather events, particularly in resource-constrained settings (Kane et al., 2020; Schaaf et al., 2020). Further, the experiences and expectations of CHWs affiliated with NGO-led programs may differ from those who are affiliated with government-led programs. Thus, efforts to strengthen CHW contributions to climate-resilient health systems must include a consideration of the various roles, responsibilities, and experiences of these local health actors amid extreme weather events. Guided by a collaboration with a Philippines-based NGO that operates a CHW program across resource-constrained settings in the Visayas and Mindanao, the objective of this study was to examine the experiences of CHWs when preparing for, responding to, and recovering from extreme weather events. Importantly, this qualitative case study recognizes that while CHWs may hold a position of leadership within their communities, they often share similar socioeconomic and demographic characteristics, as well as experiences with extreme weather events, as other community members.

2. Methods

2.1. Study setting and context

The Philippines is consistently ranked among the most disaster-prone countries in the world (Alcayna et al., 2016; Rameshshanker et al., 2021), and experiences one of the highest rates of typhoons globally, with approximately 20 typhoons and five super typhoons each year (UNDDR, 2020; Cantillas and Viray, 2023). With the increasing prevalence of these climate-related disasters, there is often little time between

extreme weather events to fully recover, which means the negative impacts of these events compound over time. In addition, disasters often disproportionately impact resource-constrained communities, where there is an increased risk of negative health and livelihood impacts due to underlying vulnerabilities and existing socioeconomic challenges. The nature of an extreme weather event also has specific implications for what can be expected of a CHW regarding community contributions to disaster risk management. Specifically, Super Typhoon Odette (internationally known as Rai) swept across the Philippines in mid-December 2021, impacting approximately 12 million people and displacing nearly three million individuals (ReliefWeb, 2022). At the time, Odette was the second strongest typhoon to ever hit the Philippines, and the third strongest storm ever recorded in the northern hemisphere. Northern Negros Oriental faced some of the worst impacts of the storm, as Odette passed directly through this area with a tropical cyclone wind signal reaching level four (winds up to 175 km/hour) (OCHA, 2022). Odette made nine landfalls across seven provinces in the Philippines, with its eighth landfall occurring in La Libertad, Negros Oriental (OCHA, 2022).

Due to a decentralized health system in the Philippines, the availability and quality of CHW programs often differs across communities (Mallari et al., 2020; Baliola et al., 2024; Dodd et al., 2021). CHWs working with the Department of Health in the Philippines are typically referred to as *barangay* health workers (BHWs), and often work at a city- or *barangay*-level.¹ In addition to the BHW program in the Philippines, NGOs also administer or support distinct CHW programs, and these CHWs remain accountable to the specific NGO program. Generally, the governance of CHW programs directly affects the objectives and reach of services, and the ways in which CHWs themselves are incentivized, trained, and supported. Despite operating outside of the public health system, previous research has considered how CHWs affiliated with NGO-led CHW programs may have more capacity and autonomy to contribute to broader social change when compared to CHWs affiliated with government-led CHW programs (Schaaf et al., 2020; Dodd et al., 2022).

This study was conducted in collaboration with International Care Ministries (ICM), which is a Philippines-based NGO that aims to address poverty and health challenges across resource-constrained communities in the Visayas and Mindanao regions. During the COVID-19 pandemic, ICM launched the Flourish program, which recruits and trains Community Health Champions who operate as CHWs (Dodd et al., 2025; ICM, 2022; Lau et al., 2020). Once recruited to Flourish, these CHWs are trained and equipped to conduct home visits guided by a mobile phone application to monitor maternal and child health and screen for health concerns in their communities. In early 2023, Flourish was expanded to include the provision of basic treatment and medicines (known as ‘commodities’ within the program) to treat common maternal and child health concerns. When more complex health concerns are identified, CHWs provide community members with referrals to local or regional health services (Dodd et al., 2025; Dodd et al., 2025; Dodd et al., 2021). Of note, there are several similarities between the Flourish program and the government-led BHW program. More specifically, broad job responsibilities (combination of health promotion, health screening, and referrals) the amount of incentives provided for work performed, and the sociodemographic profile of participating individuals (primarily women) are comparable between the Flourish program and the government-led BHW program. One difference between the two programs is the standardization of service delivery and training across communities. Previous research with individuals working in the government-led BHW program in Negros Oriental highlighted differences in service delivery and training across *barangays*, attributed to health system decentralization (Dodd et al., 2021); however, the Flourish program standardizes its service delivery and training across

¹ A *barangay* refers to a small territorial and administrative district forming the most local level of government in the Philippines.

the areas where it operates.

This study used a qualitative case study design, which generated in-depth qualitative data regarding a specific program in the Philippines. Though government-led CHWs also operate in these settings, utilizing ICM's Flourish program within this case study contributed to a meaningful exploration of how CHWs affiliated with an NGO-led CHW program experience extreme weather events, as well as their perceived capacity to provide support amid preparedness, response, and recovery efforts.

2.2. Phases of an extreme weather event

This research was guided by three key phases of engagement with an extreme weather event: preparedness, response, and recovery. Informed by Coppola (Coppola, 2015), the preparedness phase occurs prior to the disaster, and involves equipping populations who may be impacted by a disaster with resources, education, and support to minimize losses and increase chances of survival within the affected communities. The response phase involves reducing or minimizing the impacts of disasters that have either already occurred or are currently occurring to prevent further loss. Finally, the recovery phase can last for months or even years, as individuals and communities deal with the aftermath of a disaster. Though these phases are conceptualized as three distinct time periods within this study, extreme weather events are dynamic and these phases typically exist on a continuum and overlap with one another (Coppola, 2015; Alexander, 2018; Bosher et al., 2021). The interview guide for this study was developed in alignment with these three key phases to gain a comprehensive understanding of participant experiences amid extreme weather events. In addition, these phases were utilized to provide structure and analytic depth to the data analysis.

2.3. Data collection

Semi-structured, face-to-face interviews were conducted with CHWs affiliated with ICM's Flourish program ($n = 51$) by a team of four individuals (two Canadian women; two Filipina women). All CHW participants were women, and the average participant age was 35 years old. Participating CHWs lived in small cities, towns, or remote mountain communities across the municipalities of Guihulngan, La Libertad, Ayungon or Manjuyod in Negros Oriental.

Team members brought multiple strengths to this process, including previous experience with qualitative research, as well as deep contextual and cultural understanding of the study locations. Data collection occurred across four municipalities in Negros Oriental: Guihulngan ($n = 15$), La Libertad ($n = 12$), Ayungon ($n = 11$), and Manjuyod ($n = 13$) (Fig. 1). Recruitment for this study was facilitated through ICM's pre-existing relationships with CHWs, as all participants were current CHWs within ICM's Flourish program.

Two months prior to the interviews for this project, three of the four team members had developed rapport with the CHW participants through their collaborative involvement in a participatory evaluation of the Flourish program (Brubacher et al., 2025). Interviews were conducted with all interested CHWs in each of the four study locations, past the point of data saturation, to ensure that all CHWs were given equal opportunity to participate in the research. In total, 58 individuals were invited to participate and 51 individuals (87.9 %) agreed to participate in this study. Reasons for not participating in the study included the geographic location of the interviews or time limitations. The interviews took place in a central community space (e.g. church, community centre). Interview questions were guided by the three key phases of a disaster, and questions were anchored around experiences with Super Typhoon Odette, which allowed participants to share their experiences and personal stories about their preparation, response, and recovery activities. CHWs were also asked about their experiences with other extreme weather events that may have impacted their communities (see Appendix A for interview guide). Though this study was anchored

around experiences of Super Typhoon Odette, approximately five days before beginning the interviews, national warnings were sent out regarding the potential for Super Typhoon Betty (internationally known as Mawar) to impact the Philippines. Thus, questions were added during the interviews regarding how participants perceived and responded to these warnings when compared with experiences from Odette (which had occurred a year and a half prior to data collection for this study).² Research team members used field notes and debriefed regularly during the data collection process to identify opportunities to refine interview questions and improve the overall quality of data collection.

Interview questions were delivered in either English or Tagalog, and then translated into Bisaya by the Filipina research assistants, based on the preference of each participant. Informed verbal consent was received prior to each interview, and each interview was approximately 30 minutes to one hour in duration (average interview duration = 46 minutes). All interviews were audio recorded with permission and transcribed. Transcription was completed by one Canadian researcher and one Filipina researcher, who also conducted quality checks across languages and reviewed any transcriptions with low audio quality. The use of verbatim quotations from translations was done to allow for in-depth analysis of the content among monolingual team members, but also to remain as close to the participants' intended meaning as possible. Research ethics approval was obtained from the University of Waterloo (ORE #43710). Prior to coding, all interviews were translated into English and checked closely for accuracy. Thus, quotations used within this study are verbatim according to the translated interviews.

2.4. Data analysis

Data were analyzed using a hybrid deductive-inductive approach (Fereday and Muir-Cochrane, 2006) using NVivo software for organization and coding (see Appendix B for COREQ checklist). As the interview guide was structured in alignment with the three core components of the disaster risk management framework (preparedness, response, recovery) prior to data collection, using a deductive approach to the broader coding strategy ensured the objectives of the study were met and there was consistency between the data collection tools (i.e., interview guide) and data analysis (Fereday and Muir-Cochrane, 2006). Thus, these three broad themes guided the initial structure of the code book and organized the themes for analysis (Dodd et al., 2025). While the broad categories of preparedness, response, and recovery were used to deductively structure the analysis, inductive codes were then generated and applied following a close reading of each transcript. These inductive codes were developed iteratively through line-by-line coding of each transcript, and new subcodes were created, merged, or consolidated as necessary (Braun and Clarke, 2019). Coding was led by one Canadian researcher; however, members of the research team met regularly during the analysis process to discuss the identification of codes and themes to enhance rigour and reliability of the analysis (Creswell and Miller, 2000). Identifying information (such as participant names and specific *barangays*) were excluded from the analysis to maintain confidentiality (Dougherty, 2021).

2.5. Reflexivity

This study relied on a collaborative approach between the research team (inclusive of Canadian and Filipina team members) and ICM (collaborating NGO). This collaborative approach was critical in supporting participant recruitment as well as providing appropriate historical and cultural context for the study. Prior to data collection in

² Super Typhoon Betty was the strongest tropical cyclone worldwide in 2023. The typhoon passed north of Guam and entered the Philippine Area of Responsibility (PAR) on May 26, 2023, before exiting the PAR on June 1, 2023 and weakening as it moved towards Japan.



Fig. 1. Map of the study region: Negros Oriental (Guihulngan, La Libertad, Ayungon, Manjuyod), Philippines. The capital city of Negros Oriental is Dumaguete.

Negros Oriental, the four research team members conducting fieldwork ($n = 2$ Canadian researchers, $n = 2$ Filipina researchers) met to discuss the interview guide. During this meeting, team members actively reviewed the interview guide to confirm the intent of the research questions, and the Filipina researchers had the opportunity to alter the wording of questions where necessary to ensure cultural suitability and efficient translation during the interviews. During data collection, the four research team members routinely debriefed after each day of interviews to discuss findings and ensure participants' experiences were comprehensively captured. Emergent findings were also discussed with multiple members of the broader Canadian research team throughout the data collection process. These regular meetings not only iteratively informed and strengthened the data collection approach, but also fostered relationships among the research team and facilitated collective critical reflection about the positionality and potential biases of the researchers (Naidu et al., 2024). The research team also continuously discussed and reflected on the impact of contextual factors on the study. In addition, throughout data collection and analysis, research teams members considered how power dynamics may play a role in participant recruitment and responses. One approach used to address these dynamics involved drawing on pre-existing rapport with participants, which had been developed through previous interactions between members of the research team and CHWs invited to participate in the study. Immediately following data collection, one Canadian researcher (fluent in English) and one Filipina researcher (fluent in English, Tagalog, and Bisaya) transcribed the interviews, and the Filipina researcher also conducted quality checks across languages.

3. Results

3.1. Community health worker roles and positionalities

3.1.1. Additional roles and responsibilities

While participants were current members of the Flourish program, many also held multiple responsibilities in their households and communities that shaped their perceptions and experiences of extreme weather event preparedness, response, and recovery (see Table 1 for an overview of themes and subthemes). Many of the participants highlighted their roles as mothers or primary caregivers for both immediate

and extended family members within their own households, and some stated that personal financial constraints sometimes created challenges when navigating these responsibilities (P03, P24, P31, P42), with one participant mentioning:

I have two nieces who live with me and both of them have no father, so I treat them as my own children, I provide them with everything like their school fees and other financial needs and also their food (P20).

Further, some participants explained that their husbands were working in other cities to make money for the family, which left these participants as the sole caregivers within their households while also balancing obligations outside their household, including their CHW responsibilities. Beyond their role as mothers and household caregivers, some participants also held other roles that impacted their relationships with community members. For instance, several participants spoke about their experiences as *barangay* health workers (BHWs), church leaders (e.g., a *pastora* or youth leader), *tanods* (safety and security officer within the community), or savings group members (P4, P6, P8, P11, P12, P13, P22, P25, P27, P28, P39, P42, P48). These other positions contributed to the strong social networks that many CHWs held within their communities, with one participant explaining, "Considering that I've been a BHW for 13 years, so that's why I was known in my community" (P11). Several participants echoed these reflections, with one participant stating that "it's not hard to introduce myself as a CHW [to households I support]" (P13) because she was already known due to her wide social networks as a leader in other positions. Overall, holding additional roles and responsibilities within communities alongside the CHW role was perceived to lay a foundation for positive relationships with the community members they support. Indeed, participants perceived that their social connections, credibility, and pre-existing levels of trust within their communities meant that community members were open to listening to the education and guidance they provided in their CHW role.

3.1.2. Motivation to care

Participants also described the personal meaning and sense of responsibility they drew from their CHW role in their communities, saying that they were not only grateful to "give [household members]

Table 1
Overview of themes and subthemes.

Theme	Subtheme	Key considerations
Community health worker roles and positionalities	Additional roles and responsibilities	The multiple roles that CHWs held within and outside of their households not only contributed towards their responsibilities, but also provided a foundation for relationships within communities.
	Motivation to care	CHWs' sense of responsibility and a desire to care for their communities were motivating factors for their interest in providing additional care within their communities amid extreme weather events.
	Awareness and (in) action	CHWs and community members engaged in limited preparation for extreme weather events despite repeated exposure to warnings.
Preparedness	Opportunities for CHWs to contribute to preparedness	CHWs described their capacity to self-organize and provide guidance to community members prior to an extreme weather event.
	Response	CHWs prioritized the safety of their own families when there was the highest level of acute danger.
Recovery	Opportunities for CHWs to contribute to response	Despite personal experience of extreme weather events, many CHWs offered their own resources to other community members during Typhoon Odette and were perceived as community leaders.
	Challenges shaping recovery efforts	Inefficient processes and damage created challenges in the delivery and distribution of resources for communities, and impacted CHWs' ability to offer recovery support.
Future training and support	Opportunities for CHWs to contribute to recovery	Additional resources could supplement the advice that CHWs felt they could provide following an extreme weather event.
		Training and material resources could enhance the capacity of CHWs to more directly support their communities amid extreme weather events.

commodities during screening or house visits" (P17), but also to "build relationships with people" (P09), and "educate [community members] by giving [health-related] advice" (P46). Alongside highlighting the joy they felt from their ability to connect with and support others, participants specifically acknowledged their motivation to equip community members with general health information that they had learned from their training (P01, P20, P22, P28, P34, P35, P38, P41, P44). As expressed by one participant, "I am knowledgeable enough about health and seeing those people in my community coming into my house asking for commodities and advice, it makes me so happy" (P20). Motivated by deep care for their communities, most CHWs expressed an interest in providing additional assistance beyond current program responsibilities, to mitigate the impacts of extreme weather events. Across most interviews, the responsibilities that CHWs held, both internal and external to their own households, influenced how they experienced extreme weather events, their perceived capacity to provide support, and their motivation to provide additional care to their communities despite their own challenges. Though participants may hold these

positions of leadership and connections within their communities, repeated exposures and past experiences with extreme weather events shaped their opinions and experiences of preparing for, responding to, and recovering from subsequent events.

3.2. Preparedness: "you can't just be scared, instead you have to make preparations"

3.2.1. Awareness and (in)action associated with extreme weather events

When asked about preparation for extreme weather events, most participants spoke about their experiences immediately before Super Typhoon Odette. Prior to an event like Odette, notifications and warnings about the severity of the storm were sent out to communities via the news (television and radio), social media, or texts from governmental sources. However, while a few participants noted that they were unable to prepare at all due to a lack of timely information (P31, P32, P34), many participants highlighted that they did not prepare for Odette due to repeated exposure to and past experiences of extreme weather event warnings, which had reduced their perception of risk and subsequent anticipatory actions, particularly when extreme weather events became normalized within communities (P01, P03, P21, P23, P27, P47). Referring to Typhoon Odette, one participant mentioned, "We already heard in the news that there was a strong typhoon [coming] but we just ignored it because we always hear that kind of news" (P35). Many CHWs stated that prior to Odette, they would not prepare for typhoons when warned by governmental or news sources, often due to the frequency of these alerts. Instead, they reported waiting until they could physically see the impacts of the disaster itself, which was often too late to adequately prepare (P01, P02, P12, P13, P21, P23, P24, P26, P28, P32, P33, P35, P36, P37, P38, P40, P43, P44, P47, P49, P50). For example, though hearing about Odette through the news, a participant living near Ayungon explained:

We didn't expect that it would be as strong as [it was] because we hadn't experienced it before...some [people] were panicked but mostly they just didn't care. Like we didn't prepare anything because we never thought that the typhoon would be so strong. We didn't even prepare food (P44).

In contrast, one participant who lived near Ayungon explained that because she was trusted in her community, "[community members] ask me if I am going to evacuate [before an extreme weather event] and where...I say yes so that they will evacuate too" (P20). Further, a CHW living near Manjuyod mentioned that she relied on her relationships with neighbours prior to Odette, and that the advice they shared with each other was useful in preparing for the typhoon (P48). These reflections further illustrated the importance of community leadership, communication, and social networks when navigating preparation activities.

3.2.2. Opportunities for CHWs to contribute to preparedness

In contrast to experiences with Odette, and when asked about preparation activities in recent years, one CHW stated that "Odette was a lesson learned for us" (P19), and many others shared that they would now prepare food, documents, clothing, and other necessities during typhoon warnings (P03, P09, P10, P12, P21, P24, P28, P29, P33, P36, P38, P39, P40, P43, P44, P46, P47). Specifically, one participant reported how experiences with Odette impacted subsequent preparation during Super Typhoon Betty (2023) warnings:

When we heard about [Super Typhoon Betty] coming, we were traumatized and we said that we had to prepare for this...I was scared because I didn't want to experience a typhoon again like Odette...thankfully it didn't hit our area...but we prepared for Betty just in case (P46).

This shift in threat perception underscored how prior lived

experiences reportedly impacted subsequent individual and community action in the context of extreme weather events. Further, participants noted that there may be opportunities to leverage their CHW position within their communities to notify community members about extreme weather events and provide guidance on how to adequately prepare (P06, P29, P43, P47), which could be further supported by structured direction from the NGO. For instance, one CHW mentioned, “Before Odette happened, I talked to my neighbours too [and said] that whatever happens, we should go to this specific house for our safety...it’s not surrounded with trees and it’s also safe from big floods” (P46). Though this was not part of her regular CHW responsibilities, this participant exhibited an aptitude to organize and lead community members prior to Odette. Further, some participants stated that they could provide disaster-related advice to community members during their regular CHW duties, such as during home-based screening for maternal and child health concerns. For example, one participant stated that even though she did not have formal training, she would be able to provide guidance regarding disaster preparation to community members she was interacting with while completing her CHW tasks: “If I screen them, I can give advice that they have to prepare if there’s a typhoon coming” (P43). In addition, and reflecting on the remote contexts where some CHWs worked, as well as the unequal access to information across communities, one participant mentioned, “[when] I hear some news about any typhoons or that a disaster is coming, I can relay the message to [community members], because mostly in the mountain area they don’t have television [to see the warnings]” (P06). Overall, based on their knowledge from past experiences, many CHWs indicated that they were well positioned and had the capacity to provide additional support in the form of verbal warnings and advice prior to future extreme weather events.

3.3. Response: “we were just thinking about our own safety”

3.3.1. Navigating extreme weather events

Aligned with the sentiments shared surrounding disaster preparation prior to extreme weather events, participants described varying experiences amid response activities, which were influenced by their overlapping roles and identities. Most participants described their focus on immediate family members during disaster response when there was the highest level of acute danger, especially if they were the sole caregiver in their households. Specifically, one participant living near Manjuyod stated, “We had to prioritize our family... we couldn’t rely on anyone [else] because we knew that all of us [in the community] were facing the same situation” (P46).

3.3.2. Opportunities for CHWs to contribute to response

In addition, some CHWs who chose to remain at home during Odette still described the ways in which their relationships with community members influenced community responses amid the typhoon. For instance, one participant living near Manjuyod explained, “The reason why most of my neighbours evacuated to my house was because they already knew me as a person with a good heart...I was known in my community [before Odette]” (P23). During and immediately following Odette when there was limited external support from broader governmental sources due to geographical barriers, some participants described feeling a sense of responsibility towards their neighbours, and reported offering their own homes, food, and resources to other community members (P02, P20, P23, P24, P27, P34, P36). Further demonstrating a motivation to support her neighbours amid Odette, a participant living near Guihulngan stated:

I helped [community members] to go to the church as their evacuation area...some of these people went to my house, but I couldn’t accommodate [all of them] considering that my house was also partially damaged (P02).

Though CHWs often held strong relationships within their communities and were perceived to be health leaders, it is also necessary to recognize their own personal challenges in navigating the response phase of extreme weather events. Limited resources, coupled with the prioritization of familial responsibilities, contributed towards a general sense of helplessness among some CHWs during Super Typhoon Odette, with one participant living near Ayungon sharing, “[My mind was] blank at that time because everyone was panicked and I couldn’t really imagine the best way to save our situation” (P40). Though stating that she did not know how to help others during Odette, this CHW went on to say that she hoped to receive training from the NGO in the future to learn skills that could be applied towards response activities.

3.4. Recovery: “we chose to be strong and help each other to survive”

3.4.1. Challenges shaping recovery efforts

Many participants described their community’s reliance on government support and relief goods following extreme weather events; however, inefficient processes and damage to infrastructure created challenges in the delivery and distribution of resources for communities (P21, P22, P23, P25, P28, P31, P34, P40, P42, P43, P47, P49, P51). Mirroring the responses of other participants, a CHW living near Manjuyod shared, “We had to go to the boundary to get relief goods because [trucks] couldn’t pass in the river, as it was damaged. Some [community members] also weren’t able to get some [relief goods] because there were no more available” (P46). These delays and challenges associated with external aid delivery underscored the need for community-based strategies and initiatives to ensure equitable distribution of relief following extreme weather events. Further, one participant shared that her affiliation with an NGO meant that “some [people] came to my house and asked me if ICM has a budget [for disaster relief] or maybe if they can give a little help” (P23), and another stated that these interactions occurred when completing her regular CHW duties: “When I did house visits...they asked for help from me but I had [no material supplies] to give” (P38).

3.4.2. Opportunities for CHWs to contribute to recovery

After Odette, multiple participants reported returning to their regular CHW responsibilities, sometimes within one to two weeks of the typhoon. Though they prioritized their own safety and security during the height of Odette, this quick return to CHW responsibilities indicated a commitment to ensuring a continuity of care within their communities. General knowledge from ICM programming appeared to facilitate CHWs’ ability to provide support to other community members following Odette, with one participant stating, “Since [CHWs] had no commodities yet after Odette, I advised [community members] to use herbal remedies because it was taught to us by ICM before” (P22). Due to the training received through ICM’s Flourish program, CHWs were equipped with general health knowledge that reportedly facilitated their ability to provide support to other community members following Odette (P01, P22, P24, P28, P34, P35, P38, P46). Another participant mentioned, “Before I had no idea or knowledge about health, but when I became a [CHW] and joined the trainings I gained knowledge that I can share to my neighbours if they are sick” (P28). As CHWs within this context do not currently have any training in preparedness, response, or recovery actions, these quotations point to the potential for strong community-based support if NGO-led organizations were to offer specific disaster risk management information and training to CHWs. Further, though their capacity to provide material support from the NGO was limited, some CHWs reported self-funding relief goods for their neighbours, sharing their own food and water, and offering advice and emotional support following Odette. One CHW explained that she was able to help her community, but “only by giving advice because we had no budget for financial support and we also had no [physical resources]” (P44). Though similar demographic and socioeconomic characteristics were shared between participants and their fellow community members,

many of the interviews highlighted the continued motivation of CHWs to support and care for their communities following extreme weather events, in the midst of navigating their own personal challenges.

3.5. Future training and support

Though they were able to offer general health advice to community members prior to and following Super Typhoon Odette, CHWs felt limited in their ability to provide disaster-specific support within their communities, with one participant living near Guihulngan explaining, “So my neighbours just come to me to ask for help for health things, but then for disasters, no... I think if only we had training [from the NGO] for disasters, then that would be the time that we could help” (P02). Other participants also frequently stated that they would be interested in receiving disaster training, which they envisioned to include “training on how to have proper preparations when there’s a typhoon coming so that I can also share it with my neighbours” (P32); “first aid, or how to save someone who is drowning when there’s flooding” (P20); and “counselling for after [disasters], where usually there’s trauma” (P03). Alongside training, participants also indicated material resources (e.g., food, basic medicines), that they believed would be beneficial to support their communities following disasters. Overall, participants demonstrated a motivation and capacity to provide more structured and formal assistance in the context of extreme weather events, which could be facilitated with the provision of additional training and resources by the NGO.

4. Discussion

This study examined the experiences of CHWs in navigating extreme weather event preparedness, response, and recovery in four municipalities in Negros Oriental, Philippines. Though they shared similar demographic and socioeconomic characteristics with other community members, findings from this study indicate that the identities and roles that CHWs held within their communities impacted not only how they were perceived by community members, but also their capacity to provide support to others before, during, and after extreme weather events.

CHWs hold a unique position within their communities as both community members as well as health leaders with responsibilities that are shaped by their affiliation with specific CHW programs (Kok et al., 2017; Kok et al., 2017). This dual position may offer opportunities to contribute to climate resilient health systems amid extreme weather events, particularly in resource-constrained communities. For instance, in alignment with previous research (Maat et al., 2021; Shah et al., 2019; Fredricks et al., 2017; Sripad et al., 2021), CHWs in this study were seen as a valuable source of support amid extreme weather events, and multiple CHWs outlined the position of influence that they held within their communities before, during, and after Super Typhoon Odette. Despite a lack of physical resources or disaster-specific training, many CHWs in this study also noted that they felt confident in providing health advice, and desired additional training to provide disaster-specific support to their communities. As participants typically held other roles within their communities in addition to their CHW responsibilities, people who become CHWs may inherently hold strong leadership qualities and existing community connections, and thus may inspire confidence and trust among others when providing direction and support to address the health impacts of extreme weather events.

However, despite demonstrating a clear motivation to help their communities, the capacity of CHWs to contribute to climate resilient health systems as community health leaders was often influenced by their identity as community members who also experienced extreme weather events. Indeed, the capacity of CHWs to provide additional health-related support amid extreme weather events may vary during different phases of the event. For example, due to a lack of risk perception and prior experience with a typhoon of this magnitude,

participant reports signaled the necessity for community-based dialogues to share and emphasize the importance of early preparation. As previous studies have identified that perception of risk can be influenced by others with shared interests and values (Heinkel et al., 2022; Paton et al., 2013), CHWs in resource-constrained communities could act as a conduit for disseminating information during their regular interactions with community members (e.g., home-based screening of maternal and child health concerns) to support and foster community-based preparedness strategies. Given their dual position as both community members and trusted health leaders, CHWs may be able to encourage other community members to adhere to disaster risk management advice and recommendations more closely, thereby limiting the health-related challenges that are associated with a lack of knowledge and preparation (Abunyewah et al., 2020; Heinkel et al., 2022; Paton et al., 2013). Thus, CHW participation in disaster preparedness activities, including the dissemination of warnings, may positively influence disaster risk perceptions and beliefs, along with subsequent preparation activities. Of note, most CHWs in this study prioritized protecting the safety and wellbeing of their own households during the response phase of Super Typhoon Odette and other extreme weather events. As many CHWs are women, CHWs may also navigate the gendered expectations of household caregiving, which may offer an additional layer of complexity when coupled with their responsibilities as a CHW and compounded by extreme weather events. Specifically, many participants noted that they felt unable to help their communities during Super Typhoon Odette due to the reality that they were experiencing the same threat to their physical safety.

During the recovery phase of extreme weather events, CHWs in this study shared that community members appeared to rely on them for health-related, emotional, and spiritual support. Importantly, while CHWs across various contexts may not play a formal role in disaster risk management, they still often hold social networks and capital while operating on the ‘front line’ of health systems (Kok et al., 2017; Kok et al., 2017; Perry et al., 2021), with these strong community-based connections linked to increased self-sufficiency and resilience when faced with disasters (Alcayna et al., 2016; Jovita et al., 2019; Uscher-Pines et al., 2013). Immediately following extreme weather events, leveraging local social networks may be necessary for communities to recover from disasters, as neighbors typically rely on each other when external assistance is not yet available (Sripad et al., 2021; Uscher-Pines et al., 2013; Devkota et al., 2016). Thus, building upon existing positive relationships with community members and integrating CHWs’ knowledge and experiences into future disasters initiatives could support sustainable strategies to address disaster-related risks at the community-level. However, this does not mean that NGO-led CHWs should act in isolation during extreme weather events. Rather, support should be institutionalized to better balance the expectations of NGO-led CHWs with their desire to support their communities. Though government-led CHW programs may experience challenges related to financing and training, collaboration between multiple partners, including local governments and NGOs, has led to more effective implementation of CHW interventions and better health outcomes (Dodd et al., 2021). Thus, if provided with disaster-related training, information, and resources, CHWs affiliated with NGO-led CHW programs may be well positioned to contribute to community-based initiatives before and following extreme weather events (Fig. 2).

Findings from this study highlight that despite navigating their own challenges amid extreme weather events, CHWs demonstrated a motivation and capacity to further assist communities, and were able to provide informal support to community members. Although CHWs may be an effective source of local assistance amid extreme weather events, acknowledging the capacity for CHWs to provide additional support during these events must be met with a critical consideration of their scope of responsibility and corresponding tensions within the health system (Schaaf et al., 2020; Ajisegiri et al., 2023; Smith et al., 2014). Indeed, tensions within the health system have been explored across

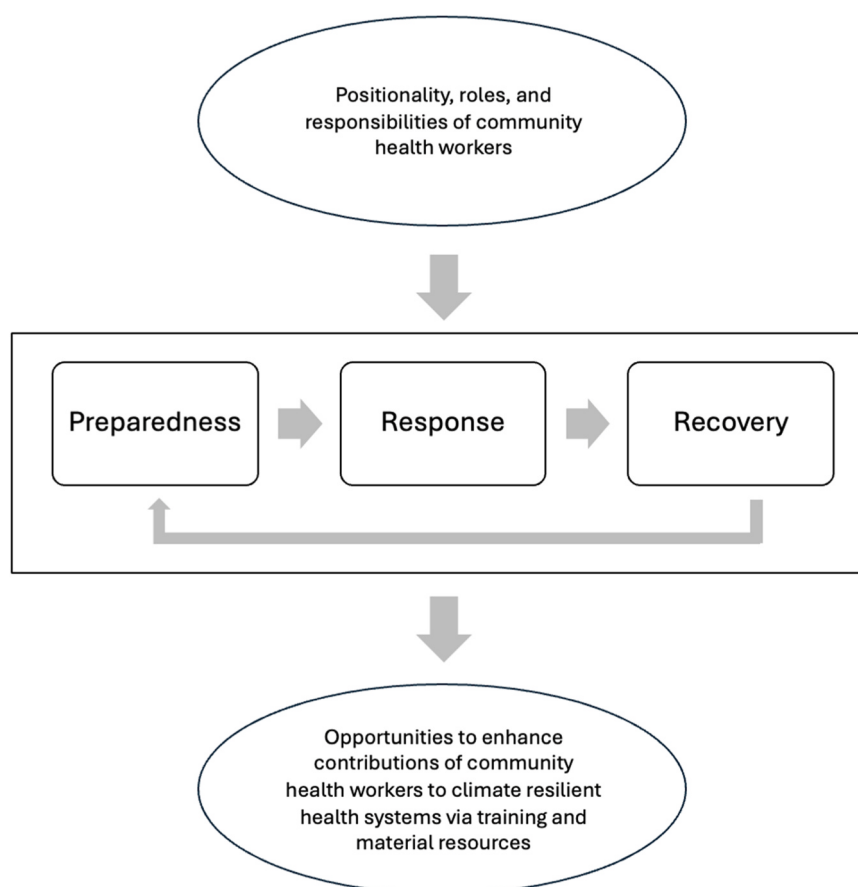


Fig. 2. Relationships between themes and subthemes.

different disasters and settings, but were particularly evident during the COVID-19 pandemic, where CHWs provided additional support beyond their regular capacity (Grant and Fernandes, 2023; Ortega et al., 2021). On the one hand, allocating training and resources to better equip CHWs during the preparedness and recovery phases of extreme weather events may strengthen community contributions to climate resilient health systems. Indeed, aligned with other studies (Nicholls et al., 2017; Fredricks et al., 2017) the NGO-affiliated CHWs in this study broadly advocated for training related to preparedness strategies and counselling following extreme weather events, in addition to material resources to distribute to community members. However, on the other hand, expecting CHWs to provide formalized health-related support during the response phase of extreme weather events may have direct consequences for the health and safety of these individuals. While CHWs are necessary to support integrated care delivery, particularly in remote and low-resource settings, task-shifting and trade-offs can cause unfair expectations and challenges in the scope of their work (Dodd et al., 2022; Speers et al., 2023; Ndambo et al., 2022). To infer that CHWs must provide disaster-related care due to their proximity to communities neglects the burden that extreme weather events have on CHWs themselves, and opens up the potential not only for burnout of these essential healthcare workers, but also an increased burden on already strained health systems. Thus, it is necessary to place CHWs' experiences within the greater context of extreme weather events, understanding that there is a balance between what CHWs can accomplish as leaders within the community while also recognizing that they too may require humanitarian aid and support following extreme weather events. Therefore, future research should consider the contextual factors that impact CHWs' experiences when developing community-based disaster risk management strategies to promote climate resilient health systems, with close attention to not overburdening CHWs as they provide

health-related supports amid extreme weather events.

Ultimately, building climate resilient health systems that can effectively prepare for, respond to, and recover from extreme weather events requires a foundation of strong community-based support (World Health Organization, 2015; Haldane et al., 2022). While community-based actors are not a replacement for broader systems level support during extreme weather events, leveraging their positionality, leadership, and connections within communities may strengthen disaster risk management strategies and support resource-constrained communities. However, CHWs' dual identities as both health leaders and community members must be considered when developing community-based disaster risk management strategies to enhance climate resilient health systems. Future opportunities to scale up CHW programs to formally incorporate community-based disaster risk management into the scope of responsibilities held by CHWs need to be met with appropriate guidance, support, resources, and compensation to match the increased expectations.

4.1. Limitations

This study focused on the experiences of CHWs affiliated with an NGO-led CHW program amid extreme weather events in one province (Negros Oriental) in the Philippines, which may have limited applicability to other disaster contexts or with other types of health workers, including BHWs. Further, interpreters were used which may have resulted in response distortion or social desirability bias. In addition, all participants in this study were women, shared similar demographic characteristics, and were recruited according to their involvement with a specific CHW program in Negros Oriental. Thus, participant experiences may not be reflective of other community-based health actors with different socio-demographic characteristics or located elsewhere in the

Philippines. Similarly, these experiences may not be reflective of other community members who were the recipients of support from CHWs. Future research could explore how different community-based health actors operate alongside community members to navigate disaster preparedness, response, and recovery amid extreme weather events.

5. Conclusion

This study examined how CHWs affiliated with an NGO-led CHW program navigated preparedness, response, and recovery amid extreme weather events in the Philippines. Through exploring experiences with Super Typhoon Odette, this research highlights the role of CHWs as critical actors in providing health-related support and disseminating knowledge, particularly in resource-constrained communities. Despite limited disaster-specific training, CHWs in this study demonstrated confidence in providing guidance to community members, which could be further strengthened by the incorporation of relevant resources and structured training opportunities. Further, while CHWs demonstrated capacity and a motivation to support preparedness and recovery activities within their communities, their responsibilities to family and the immediate threat to their own safety, and that of their household members, limited their ability to provide additional support during the response phase of extreme weather events. Notably, this study builds upon existing disaster risk management literature by providing insight into CHWs' dual identities as both community members and community health leaders, and how their responsibilities within their homes and communities impact their ability to navigate extreme weather events. Overall, this research presents the experiences of CHWs affiliated with an NGO-led CHW program amid extreme weather events and addresses how their identities and roles within communities shapes their contributions to climate resilient health systems.

CRedit authorship contribution statement

Bridget Beggs: Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Laura Jane Brubacher:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Monica Bustos:** Writing – review & editing, Methodology, Investigation, Data curation, Conceptualization. **Lincoln Lau:** Writing – review & editing, Funding acquisition, Conceptualization. **Jennifer Liu:** Writing – review & editing, Funding acquisition, Conceptualization. **Warren Dodd:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization.

Consent to participate

All participants provided verbal informed consent to participate.

Ethical considerations

Ethics approval was provided by the University of Waterloo Research Ethics Board (Certificate # 43710)

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Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Lincoln Lau reports a relationship with International Care Ministries that includes: employment. All other authors declare that they have no known competing financial interests or personal relationships that could

have appeared to influence the work reported in this paper.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ssmhs.2025.100130.

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