

Actor-network analysis of community-based organisations in health pandemics: evidence from the COVID-19 response in Freetown, Sierra Leone

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Freetown, Sierra Leone, is confronted with health risks that are compounded by rapid unplanned urbanisation and weak capacities of local government institutions. Addressing them implies a shared responsibility between government and non-state actors. In low-income areas, the role of community-based organisations (CBOs) in combating health disasters is well-recognised. Yet, empirical evidence on how they have utilised their networks and coordinated community-level strategies in responding to the COVID-19 pandemic is scant. This paper, based on a qualitative study in two informal settlements in Freetown, employs actor-network theory to understand how CBOs problematise COVID-19 as a health risk, interact with other entities, and the subsequent tensions that arise. The findings show that community vulnerabilities and past experiences of health disasters informed CBOs' perception of COVID-19 as a communal emergency. In response, they coordinated sensitisation and mobilisation programmes by relying on a network of actors to support COVID-19 risk reduction strategies. Nonetheless, misunderstandings among them caused friction.

Keywords: actor-network theory, community-based organisation, COVID-19, Freetown, health disaster, local responses

Introduction

Cities are hotspots of health disasters. In 2018 alone, 96 infectious disease outbreaks were reported in various towns and cities across Africa, of which 85.4 per cent were epidemic-prone diseases, with cholera being the most common (Mboussou et al., 2019). Ebola (2014–16), for example, was at the heart of West Africa's most dangerous epidemic in history at the time, claiming approximately 11,000 lives largely due to systemic challenges related to the socioeconomic, political, and ecological aspects of health disasters (Ifediora and Aning, 2017). Presently, the COVID-19 pandemic represents the continent's major health disaster hazard. Confirmed cases and deaths in Africa stood at 4,218,239 and 112,170 respectively at 07:27 GMT (Greenwich Mean Time) on 29 March 2021 (WHO, 2021).

Complicating matters further, cities in Sub-Saharan Africa are considered to be among the most vulnerable to health disasters owing to the old but persistent structural

ills of ‘urbanisation without development’ (Boadi et al., 2005, p. 465), inadequate planning for health disasters (Cobbinah, Erdiaw-Kwasie, and Adams, 2021), a lack of integration of urban planning and public health interventions (Anaafo, Owusu-Addo, and Takyi, 2021), and deficits in basic infrastructure, such as the water supply and sanitation (Satterthwaite, Sverdlík, and Brown, 2019; UN-Habitat, 2020). These persist amidst weak governance systems—characterised by ineffective planning and coordination with sector agencies—and inadequate resources to confront proactively the structural challenges that expose residents to health disasters (Dodman et al., 2017; Erdiaw-Kwasie et al., 2020).

Cities in Africa have largely escaped the initial alarming predictions of a COVID-19 onslaught of mortality (Obeng-Odoom, 2020). Yet, while the fatality rate of the pandemic on the African continent pales in comparison with that of Europe or the United States, emerging evidence points to potential long-lasting effects on livelihoods and human settlements that are already facing severe vulnerabilities (UN-Habitat, 2020; Kamalipour and Peimani, 2021). Given that the majority of Africa’s urban population resides in informal settlements where existing socio-spatial vulnerabilities persist, such as poverty, marginality, water and sanitation deficits, overcrowding, and poor housing conditions (Kita et al., 2020), the COVID-19 pandemic could exacerbate conditions and thus engender all forms of health disaster-induced marginality. Unsurprisingly, just before and in the early days of the COVID-19 pandemic, scholars warned that informal and low-income settlements in African cities would require immediate action as historical precedence shows that such areas are impacted severely by health disasters (Ezeh et al., 2017; Satterthwaite, Sverdlík, and Brown, 2019; Smit, 2020; Kamalipour and Peimani, 2021). Consequently, the United Nations Human Settlements Programme (UN-Habitat), in its first report on COVID-19 in African cities, called for contextualised measures that target informal settlements through community-based organisations (CBOs) (UN-Habitat, 2020).

The recommendation of UN-Habitat is underpinned by the realisation that reducing community vulnerabilities and improving the capacity of communities and organisations builds resilience to health disaster risks (Sherr et al., 2016). The role of CBOs—herein defined as organisations that are driven, governed, and constituted primarily by residents to advance development in their domicile community—in addressing health challenges pervades the community development literature (Wouters et al., 2012; Grandisson, Hébert, and Thibeault, 2014; Rezaei et al., 2019; Gilmore et al., 2020; Osuteye et al., 2020). More particularly, in marginalised and disadvantaged communities where essential services are largely neglected by local and state authorities (Okyere, 2018; Chigbu and Onyebueke, 2021), the role of CBOs is pronounced.

In Sierra Leone, CBOs have historically acted as salient actors in responding to epidemics at the local level. This has been shaped by sociopolitical, economic, and technical factors that manifest not only as structural deficiencies in health infrastructure and management systems (Jacobsen et al., 2016), but also as distrust in governance and an international epidemic response system that often ignores community history, knowledge, experiences, and actors (Bolten and Shepler, 2017). Drawing on

ethnographic methods, recent scholarship has highlighted the important role of community actors in health disasters such as Ebola and COVID-19. For instance, in the early days of the Ebola epidemic, Shepler (2017, p. 458) observed through participant observation that a network of community volunteers and organisations ‘solved problems and allowed things to run’ via screening and sensitisation. Similarly, Otsuteye et al. (2020), employing field-based interviews with community organisations, disclosed that during the early stage of the COVID-19 outbreak, CBOs shared information and provided relief in the form of food and water to limit the potential impacts on the urban poor.

While such studies offer insights into the responses of community organisations to recent health disasters in the case of COVID-19, it is still unclear how CBOs have utilised their networks to respond to the pandemic at the community level. In addition, although such community-level responses to COVID-19 are reported to be common in informal settlements, CBOs’ activities and experiences in informal areas have mostly been excluded from national and global COVID-19 planning and emergency response (Conteh et al., 2021). Consequently, this paper uses actor-network theory (ANT)-based analysis to yield more insights into the coordinating and networking activities of CBOs as part of COVID-19 risk reduction in highly vulnerable informal settlements. This is relevant for two reasons. First, CBOs’ interactions with COVID-19 through their coordinating and networking activities to respond to this health disaster represent the risks embedded in this framework (Healy, 2004; Haug, 2012). Second, studying the response of CBOs to COVID-19 gives credence to the potentiality of ‘ANT as an analytical tool in disaster risk management and as a tool for planning, design and decision-making’ (Neisser, 2014, p. 105).

At its core, this paper reveals how CBOs have responded to the COVID-19 pandemic in poor urban communities in Freetown through their actor-networks. Specifically, it provides insights into how they viewed the COVID-19 pandemic, how their networks of community actors responded to the pandemic, and the tensions that emerged among them. The study also reflects on lessons for disaster management communities to enhance the role of CBOs in building community resilience to health disaster risks and vulnerabilities. Following this introduction, the next section contains a review of literature on CBOs and health disasters. The third section highlights the theoretical underpinnings of the study, whereas the fourth and fifth sections describe the study context and the methodology adopted. The results, discussion, and conclusions are presented in the sixth, seventh, and eighth sections, respectively.

Communities, CBOs, and health disasters

Previous health disasters have revealed that governments and external actors have frequently taken action with little to no community input (Marston, Renedo, and Miles, 2020). However, lessons from the Ebola epidemic and the COVID-19 pandemic point up the central role of communities in addressing health disasters (Gillespie et

al., 2016; Pedi et al., 2017; Gilmore et al., 2020). Indeed, making communities central to health disaster interventions minimised the antagonism that many Ebola response teams faced in West Africa (Camara et al., 2020). Such revelations have helped to shift the perceptions of communities regarding partners in health disaster interventions and emphasise the strengths of communities rather than their vulnerabilities (Plough et al., 2013; Enria, 2020). What is more, communities are composed of actors who have knowledge of local contexts, social and political dynamics and structures, and the cultural nuances that can help to frame understanding and response strategies (Corburn et al., 2020; Gilmore et al., 2020; Osuteye et al., 2020; Conteh et al., 2021).

Consequently, scholars underline the importance of engaging community actors to improve understanding and responses to health disasters (Wilkinson, 2017; Camara et al., 2020). In the absence of such engagement, Camara et al. (2020) observed that interventions were ineffective and unresponsive. Hence, involving communities in health disasters is not only critical, but also legitimate and essential for community and health system resilience (Wilkinson, 2017, 2020; Camara et al., 2020). The benefits include helping to reduce community reluctance, identifying appropriate and urgent actions to reverse an outbreak, decreasing community–humanitarian actor tensions (Camara et al., 2020), addressing misinformation and barriers to behavioural change (Enria, 2019; Geiger, Harborth, and Mugyisha, 2020), building trust, securing community buy-in, and localisation and effective implementation of response strategies (Enria, 2020; Geiger, Harborth, and Mugyisha, 2020). More importantly, it strengthens relationships among actors and makes interventions context-specific, while moving control and ownership from external organisations to local communities (Toppenberg-Pejcic and Gamhewage, 2019; Leach et al., 2020).

Community actors working to respond to health disasters comprise state and non-state entities—with non-state actors often playing a greater role, particularly in countries with a weak governance apparatus to address community challenges (Post, Bronsoler, and Salman, 2017; Clark-Ginsberg, Blake, and Patel, 2020). In their review, Gilmore et al. (2020) identify six types of actors in the COVID-19 literature: traditional, religious, and governing leaders in communities; community- and faith-based organisations; community groups; health management/community health committees; individuals; and key stakeholders. All of them perform different roles in one or more stages of health disaster response (Corburn et al., 2020; Geiger, Harborth, and Mugyisha, 2020; Osuteye et al., 2020). Indeed, the role of CBOs is evident in 11 health disasters: acquired immunodeficiency syndrome (AIDS); Avian influenza; *E. coli*; Ebola Virus Disease; Hepatitis C; Malaria; Influenza A (H₅N₁); Influenza A (H₁N₁); Tuberculosis; Syphilis; and Zika Virus Disease (Rezaei et al., 2019). For example, during the Ebola epidemic of 2014–16, CBOs were instrumental in building community trust, encouraging social and behavioural change, and conducting risk communication and surveillance and tracing (Mbaye et al., 2017). CBOs are therefore ‘a credible resource and partner[s]’ in responding to health disasters in communities (Camara et al., 2020, p. 1774).

Furthermore, studies in informal settlements reveal that in the absence of a national and humanitarian response, many communities have remained resilient and responded to Ebola and COVID-19 on their own terms (Conteh et al., 2021). Here, CBOs utilised their understanding of their community to implement different strategies to fill gaps in state and global responses to health disasters in their communities (Macarthy et al., 2017; Corburn et al., 2020; Osuteye et al., 2020; Wilkinson, 2020). They also activate community systems and leaders during health disasters to help residents navigate risks and provide mechanisms for recovery (Wilkinson, 2020). CBOs' immense understanding and awareness of their community settings make them knowledge holders and producers (Benton, 2017; Bolten and Shepler, 2017; Corburn et al., 2020), which is essential to conceptualise better health risks and responses (Conteh et al., 2021).

Yet, the exclusion of community actors from health disaster response persists, particularly in informal settlements—as is evident in such contexts during the Ebola and COVID-19 outbreaks in Sierra Leone (Gillespie et al., 2016; Wilkinson, 2020; Conteh et al., 2021; Wilkinson, Conteh, and Macarthy, 2021). This makes the calls to strengthen community engagement processes and empower CBOs in health disaster responses stronger for informal settlements. However, given the multiple and varied actors in communities and recognition of the instrumental roles of CBOs in health disaster response (Mbaye et al., 2017; Rezaei et al., 2019; Osuteye et al., 2020; Wilkinson, 2020), it is imperative to comprehend their operations to inform better the means to engage them successfully. One way to do so is to employ ANT, as is explained in the following section.

Actor-network theory: an overview

Generally, ANT is utilised as a conceptual and methodological framework to understand complex processes and outcomes of societal change by identifying the relationships among different elements of society, often dubbed associations (Latour, 2005; Bilodeau and Potvin, 2018). ANT recognises that there are both human and non-human elements, collectively known as actants within different social contexts. These actants are assembled to comprehend, build knowledge of, and influence the successes and failures of societal processes and outcomes (Fenwick, 2010). By understanding actants and their associations, scholars develop actor-networks that characterise actants (Latour, 2005), their influences on each other, the coalitions and alliances they form, and their competing and/or complementary goals or agendas (Callon, 1986; Latour, 2005; Piovesan, 2020).

The scholarship on ANT encompasses critical reviews (Murdoch, 1997; Fine, 2005; Oppenheim, 2007; Whittle and Spicer, 2008; Alcadipani and Hassard, 2010; De Munck, 2017; Simandan, 2018) and ethnography approaches that use qualitative data collection and analytical strategies to examine the processes and outcomes of societal change (Herbert, 2000; Law and Singleton, 2013). In terms of its application, ANT provides an analytical lens to understand the active forces that affect the

resilience of humans, communities, and systems (Rydin, 2010; Dwiartama and Rosin, 2014). Scholars have also applied ANT to study the interactions of stakeholders in the tourism industry (Arnaboldi and Spiller, 2011; Van der Duim, Ren, and Thór Jóhannesson, 2013), strategic management (Bryson, Crosby, and Bryson, 2009), urban planning (Boelens, 2010; Rydin, 2010, 2013), and health-related research (Bilodeau and Potvin, 2018; Bilodeau et al., 2019).

Across these contexts, ANT as an analytical framework has attracted some degree of criticism from different scholars. For Whittle and Spicer (2008), it assigns intentionality to the non-human elements of an actor-network and inadequately conceptualises the differences among structure, agency, and intentionality. De Munck (2017) also argues that ANT lacks an appreciation of power dynamics, political biases, and morality that may be embedded in the emergence and persistence of the actor-network, such as inequality, injustice, and sustainability.

Nevertheless, the use of ANT in health research continues to gain prominence due to its ability to yield insights into intersectoral actions and associations among community social systems and how they impact on residents' health (Bilodeau and Potvin, 2018; Bilodeau et al., 2019). In addition, the increasing role of technology in health disaster interventions has rendered actor-network analysis in the sector more critical (Lehoux, 2006). ANT has provided a way to understand the interactions apparent in socio-technical networks and how they generate, support, and sustain innovations in public health interventions (Bilodeau and Potvin, 2018; Bilodeau et al., 2019). Furthermore, it offers a framework to determine how intersectoral actions are produced and to reveal how associations among community needs, culture, and history of communities are crucial for linking the processes and effects of intersectoral action to improve resident's health and living environments (Lehoux, 2006; Bilodeau and Potvin, 2018; Bilodeau et al., 2019). Neisser (2014) also demonstrated how ANT is a relevant tool for disaster risk planning and management. Yet, the use of a network approach for comprehending the activities of CBOs during health disasters is limited. This study makes a contribution to the extant literature, therefore, by using ANT to assess CBOs' responses to the COVID-19 pandemic.

Study context

Sierra Leone and Freetown city

Sierra Leone is located in West Africa, bordering Guinea to the north and east, Liberia to the south and southeast, and the Atlantic Ocean coast to the west. It has a population of about 7.1 million people (Statistics Sierra Leone, 2017; UNDP, 2019). Civil war from 1991–2002 and the consequent political instability weakened the institutional system for addressing the country's wide spectrum of risks related to poverty, education, health, water and sanitation, and housing (UNDP, 2019). The broader picture of susceptibility to disaster risk is, however, conditioned by the historical and political-economy context of health disaster risk reduction. For instance,

colonial public health planning occurred along wealth and ethnic lines, persisting in post-civil war Sierra Leone (Yamanis, Nolan, and Shepler, 2016; Shepler, 2017; Lynch, Nel, and Binns, 2020; Conteh et al., 2021). Even in relation to international public health response, Wilkinson (2017) records that there is overemphasis on biomedical and technical solutions and little engagement with the history or local knowledge of disease outbreaks. Endemic corruption during the post-war aid boom and the broken mechanisms of international aid flows—often directed at the local NGO (non-governmental organisation) partners of international agencies and politicians using health emergencies to enrich themselves—have deprived trusted networks of CBOs of essential resources (Ibrahim and Shepler, 2011; Shepler, 2017). Health disasters thus occur amidst mistrust of state governance and health systems (Yamanis, Nolan, and Shepler, 2016; Shepler, 2017).

Freetown city, located in the western area, is the capital of Sierra Leone and has a population of around 1.056 million. Its growth has been characterised by ineffective planning and urban management, leading to poorly organised and overcrowded residential living conditions and inadequate access to basic environmental and social services (Lynch, Nel, and Binns, 2020). Informality, in terms of livelihoods and residential housing, is a dominant feature of everyday urban life in the city (Oviedo et al., 2021). Indeed, there are 64 informal settlements in Freetown (Koroma et al., 2018), with 70–80 per cent of the city's labour force working in the informal sector (Rigon, Walker, and Koroma, 2020). These informal settlements are vulnerable to health disaster risks as they have consistently experienced outbreaks of diseases such as Cholera, Ebola, and Lassa fever (Koroma et al., 2021). Freetown was selected for this study because of (i) the vast expanse of informal settlements that are vulnerable to health disaster risks, (ii) its experience of previous health disasters (such as Cholera and Ebola), and (iii) the active role of CBOs in the city.

Overview of the COVID-19 pandemic in Freetown

Sierra Leone's first case of COVID-19 was reported on 31 March 2020, and Freetown soon became the epicentre. As of 29 March 2021, there were 3,970 confirmed cases, as well as 79 deaths and 2,790 persons in recovery. The low number of recorded cases is attributable to minimal national testing capacity (Osuteye et al., 2020). Until February 2021, there were only three testing laboratories nationwide, with a testing capacity of 400–500 per day. The figure has now increased to six, with a daily testing capacity of 1,000 (WHO, 2021). Weak testing capacity exists alongside limited healthcare facilities, insufficient logistics, and inadequate funding.

Like previous health disasters such as Ebola, COVID-19 has had a debilitating impact on the everyday lives of residents, especially women, children, and informal sector workers (Koroma et al., 2021). In the early days of the pandemic, government directives, including a lockdown, affected economic activities in the city. Their ramifications for residents subsequently led to the government instituting a social protection programme (including emergency cash transfers) for low-wage and urban informal

workers (Koroma et al., 2021). There have also been ongoing efforts to increase community preparedness for COVID-19 through engagement between CBOs, local agents of international NGOs, and state actors (Osuteye et al., 2020).

Study sites: Cockle Bay and Portee

Two informal settlements, Cockle Bay and Portee were selected for this study due to their vulnerability to health and environmental risk, the active presence of CBOs, and their experience in handling past disease outbreaks. Our classification of these communities as ‘informal settlements’ is based on housing and basic infrastructure conditions (Koroma et al., 2018, 2021; Rigon, Walker, and Koroma, 2020), and is shared by local stakeholders such as the Sierra Leone Urban Research Centre, experts, and NGOs.

The first community, Cockle Bay, is an informal settlement located along the western coast of Freetown and approximately five kilometres from the city centre. It was previously a site covered with mangrove forest and deposits of cockles. Cockle production was the major livelihood activity of most people in the area until over-exploitation. The current population of Cockle Bay is estimated at around 20,000 people (Koroma et al., 2018), living on a land area of 18.2 hectares.

Portee, in comparison, is a coastal community situated in the eastern part of Freetown, with a population of 24,855 (Statistics Sierra Leone, 2017). As with other informal settlements in Sierra Leone, it has experienced significant population growth over the years. During the civil war, a significant proportion of internally displaced persons from conflict-ridden areas moved to Portee upon their arrival in Freetown (Koroma et al., 2018).

Both communities are characterised by overcrowding, poor housing conditions, and limited access to water and sanitation facilities (Koroma et al., 2018). The resulting poor sanitation situation has made public and environmental health issues a major problem in Cockle Bay and Portee. Cholera, Malaria, and Typhoid are the major health burdens borne by residents. Portee, for example, was affected by the Cholera outbreak of 2012 and the worst hit by the Ebola epidemic of 2014–16. Informal economic activities (such as fishing, petty trading, and sand winning) are the pre-dominant sources of livelihood for most residents in the two communities.

Research approach

The research used a case study design (Yin, 2018), which gave agency to CBOs, practices, and responses to the COVID-19 pandemic. ANT was deployed as an analytical tool to comprehend the workings of CBOs in tackling COVID-19 in Cockle Bay and Portee. The study utilised qualitative research techniques that allowed for an in-depth understanding of how various CBOs interpret a crisis situation and interact with other actors to translate objectives into initiatives (Thapa, Budhathoki, and Munkvold, 2017).

Data collection

Data for this research were collected by means of in-depth interviews. Before the interviews, the team held consultation sessions with a representative of a network of CBOs in the two communities and a local development actor with experience of working with CBOs and community leadership. The study purposively chose five CBOs from the two case regions, Cockle Bay and Portee. The selection of the CBOs

Table 1. Details of informants interviewed and sample size

Informant	Details of informant	Position held	Type of interview	Sample
Cockle Bay				
CBO	Children Talent Education	Leader	Unstructured	1
	Elite Youth Organization	Leader	Unstructured	1
	Foundation for the Future (FFF)	Leader	Unstructured	1
	Mafengbeh Artist Union	Leader	Unstructured	1
	Save the Children Sierra Leone (NGO)	Leader	Unstructured	1
Opinion/community organisation	Community traditional group	Chief	Unstructured	1
	Women's group	Leader	Unstructured	1
	Religious group	Leader	Unstructured	2
	Councillor	–	Unstructured	1
Experts			Unstructured	2
Government official working in the community	Public health worker	Staff	Unstructured	2
Total				14
Portee				
CBO	Youth for Development Network	Leader	Unstructured	1
	Benk Youth Organization	Leader	Unstructured	1
	Portee Millennium Youth Organization	Leader	Unstructured	1
	Tumara	Leader	Unstructured	1
	Portee Rokupa Advocacy Network	Leader	Unstructured	1
Opinion/community organisations	Representative of Rokupa-Portee Wharf	Chair	Unstructured	1
	Community traditional group	Leader	Unstructured	1
	Councillor	–	Unstructured	1
	Religious	Leader	Unstructured	2
Experts			Unstructured	2
Government official working in the community	Public health worker	Staff	Unstructured	2
Total				14

Source: authors.

was based on (i) their activities as part of responses to the COVID-19 pandemic in the communities, (ii) their previous experiences of disease outbreaks in the same communities, and (iii) the availability of their representatives for interview during the time of data collection. Additional interviews were conducted with community-level actors to capture their views on and interaction with CBOs in responding to the COVID-19 pandemic. Verbal consent was sought from all potential respondents before the interviews. Interviews were carried out at the premises of the selected CBOs and in a semi-public space within the surroundings of the coordinating CBOs in the case of the focus group discussions (FGDs).

Overall, 28 individual interviews were conducted with various community actors (see Table 1), each lasting between 40 and 60 minutes. The individual interviews were augmented by one FGD in each community. The gender composition was equal: four males and four females. FDG participants were aged 20 years or above. Interviews were performed in December 2020 by Louis Kusi Frimpong, along with two research assistants familiar with the communities, trained in qualitative work, and active in the local network of community organisations. Interviews were in either Sierra Leonean Creole or English, depending on the preference of interviewees.

Data analysis

Data were analysed using thematic content analysis. Following Braun and Clarke's (2006) six-phase approach to theoretical thematic coding, the analysis entailed: (i) generating transcripts with repeated readings of the data; (ii) producing initial codes; (iii) collating codes and searching for themes via ANT; (iv) reviewing and refining themes; (v) defining and naming themes; and (vi) writing and discussing findings. Based on this analytical approach, the results and the discussion that follow employ the hermeneutic principle of 'sensemaking' (Thapa, Budhathoki, and Munkvold, 2017); that is, all authors drew on illustrative quotes to identify common and salient themes with regard to the activities of CBOs and their networks in COVID-19 responses until saturation was reached.

Results

CBOs problematisation of COVID-19

Representatives of CBOs in the two communities, Cockle Bay and Portee, viewed COVID-19 as a serious health emergency, although the city of Freetown and Sierra Leone as a whole had recorded comparatively few cases. This framing of COVID-19 as a serious health risk to communities by participants was informed by reports of increasing rates of infection, and fatalities, earlier in China and later in Europe and the US. According to the representatives of CBOs who were interviewed, the COVID-19 pandemic must be treated as a communal rather than an individual risk, given its fast pace of transmission between people and existing socioeconomic vulnerabilities in

informal settlements. CBO representatives and community leaders emphasised deficits in water and sanitation facilities and inadequate health amenities and services as among the socioeconomic problems that can facilitate the spread of the virus. Others shared that most people engaged in informal economic activities in Freetown expressed critical concerns about COVID-19, making it both an urgent and a communal risk. In the words of two participants:

COVID-19 is a serious health matter, and it bothers the entire community. For us, our situation is even more serious because, as a slum community, we don't have a health centre. We don't also have pipe water and toilet facilities. If we don't look at this problem with all seriousness, it will go out of our hands, and a lot of people will contract the disease (Representative of Children Talent Education, Cockle Bay).

COVID-19 is a serious health crisis. . . . Knowing that we don't have much support, and most people are engaged in low-income livelihood activities, our lives will be affected, and most residents will lose their lives if they get infected. I can tell you a lot of people lost their jobs during the first lockdown, and they are yet to recover fully (Community leader, Portee).

Perceptions of COVID-19 were also shaped by previous experiences of health disasters, such as the Ebola epidemic in Freetown. CBO representatives and other community stakeholders recounted the serious impact of Ebola on families and their communities. Interviewees drew similarities between COVID-19 and Ebola in terms of the nature of transmission and the disproportionate effect on residents in informal communities. All of these remarks culminated in their framing of the COVID-19 pandemic as an urgent issue requiring proactive and concerted interventions. A member of a women's group in Cockle Bay commented:

Diseases like COVID-19 and Ebola are serious issues that affect a community. . . . Ebola affected my family and me. The communication breakdown, closing of borders, and I even lost my job not to talk of others who lost their loved ones. These are clear reasons to show that the COVID-19 outbreak is not an individual issue.

The role of CBOs in health disasters and transitions towards a COVID-19 response

Representatives of CBOs stated that their organisations predominantly engaged in COVID-19 sensitisation and awareness campaigns, involving, inter alia, educating residents on its signs and symptoms, preventive measures, and treatment options. These activities were mostly performed with the assistance of health practitioners, who offer training to CBO members. In addition, they noted that their organisations underlined sensitisation due to the growing tendency for the procurement of misinformation on COVID-19 through social networks and social media platforms, and hence misconceptions about coronavirus. Here, too, interviewees drew on lessons

from the Ebola epidemic, alluding to misinformation as one of the principal social factors that fuelled infection rates. A member of the Elite Youth Organization in Cockle Bay remarked:

Our main focus on the disease outbreak [COVID-19] in our community is to sensitise the people about the disease, its signs, and symptoms. Social media makes false information travel quickly and accepted easily. For COVID-19, we are working with health practitioners. We saw the vulnerability of our people and the community as a whole and we thought it fit to come on board and help with public campaigns.

Some of the CBOs also made donations to community residents, especially of sanitary items such as soap and sanitiser. For instance, the Benk Youth Organization, a CBO in Portee, engaged in public fundraising to purchase sanitary items which were donated to community residents in need. Representatives pointed out that the sensitisation campaigns of CBOs are combined with other practical actions to prevent the spread of COVID-19 among residents. One member of the Benk Youth Organization added:

Our main focus has been on community sensitisation and [the] donation of sanitary materials and food items to the most vulnerable people within the community. We were inspired by the work of other organisations. Our organisation's previous focus was on supporting our members with funds to start their businesses.

Interviewees also revealed that most CBOs transitioned from other development initiatives to support community responses to health risks, including Cholera, Ebola, and, currently, COVID-19. The Elite Youth Organization in Cockle Bay, for example, was primarily a welfare group that focused on youth empowerment through skills development and networking. Similarly, the principal focus of the Foundation for the Future (FFF) in Cockle Bay was educational support for school children. However, growing susceptibility to health risks has necessitated that both CBOs extend their focus areas to tackling health disasters such as the Ebola epidemic and now the COVID-19 pandemic. As participants from these two organisations respectively explained:

Our organisation was in existence before the Ebola and COVID-19 outbreak. Our strategies changed because of the two health emergencies. We saw that our community people were not well equipped on how to prevent being infected or even use preventive measures. We subsequently decided to embark on house-to-house sensitisation to help our community residents.

Our strategic focus area expanded after the outbreak of the diseases [Ebola and COVID-19]. Instead of focusing only on helping the needy children go back to school, we were then heavily involved in sanitation issues to reduce vulnerability to disease outbreaks.

The transitions to supporting communities in addressing their health risks have not changed the main strategic focus of these CBOs. Rather, they use their experiences and expertise to perform roles that enhance community responses to COVID-19. For instance, the primary focus of the Mafengbeh Artist Union in Cackle Bay is on supporting youths in the music industry. However, they also aided the COVID-19 fight by composing songs containing messages on the impacts of coronavirus and prevention strategies. The Youth for Development Network in Portee, which is noted for youth mobilisation for community development, leveraged the trust that exists between the organisation and its members to rally young people in the community for COVID-19 sensitisation. Similarly, the Portee Millennium Youth Organization and the Elite Youth Organization, in collaboration with health experts, marshalled and trained youths as volunteers to sensitise residents about COVID-19. A representative of the Elite Youth Organization in Cackle Bay said:

The strategy we adopted was massive house-to-house sensitisation, to explain to community residents how the virus is transmitted and how they can prevent themselves from getting infected. The entire community benefited from it, specifically women, children, and persons with disabilities.

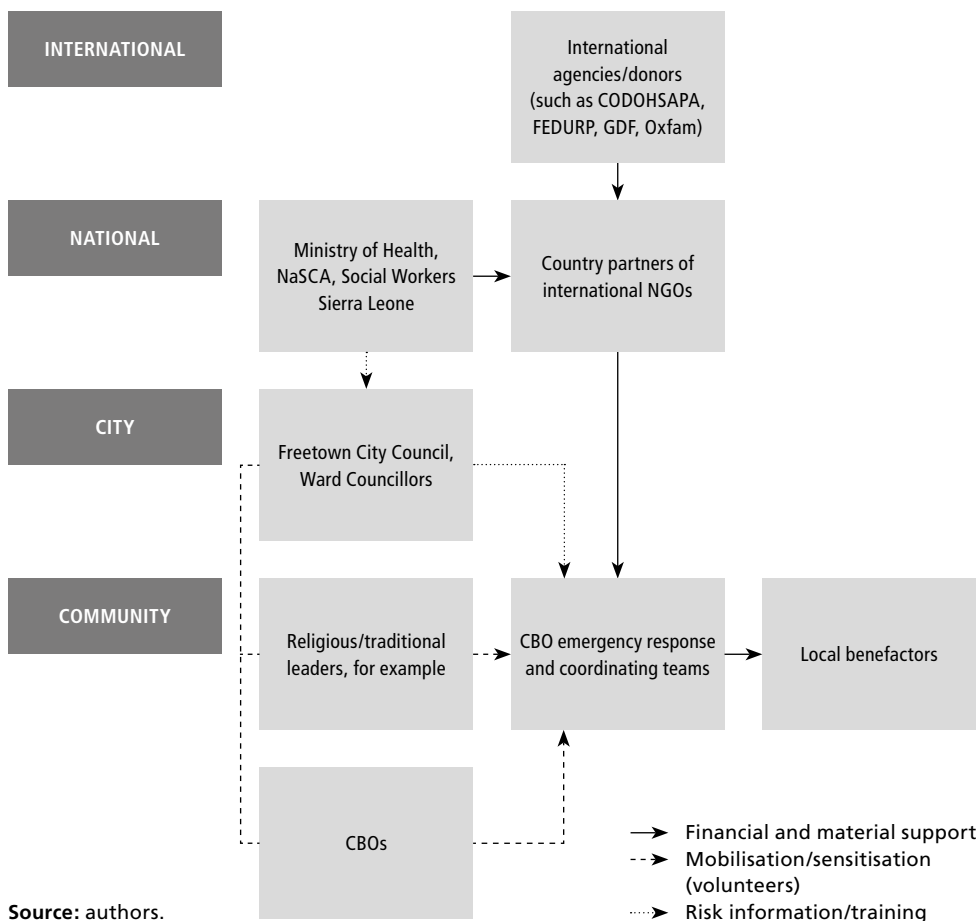
CBO networks and linkages and flows in COVID-19 responses

CBOs played a major role in the two communities in coordinating efforts to respond to COVID-19. They interacted with a range of state and non-state actors at different levels, from the international to the community. Their networks included international actors (such as the Federation of the Urban and Rural Poor (FEDURP) and Oxfam), central state actors (such as the Ministry of Health and Sanitation and the National Commission for Social Action (NaCSA)) and Members of Parliament, city-level public actors (Freetown City Council), and community-level actors (such as traditional leaders and religious groups). Interaction with such a diverse array of actors was critical to the implementation of COVID-19 sensitisation programmes and the distribution of donated items to vulnerable residents in the communities.

Furthermore, to enhance the success of the COVID-19 response, CBOs and local and state actors had to form community coordinating units or teams to coordinate activities to respond appropriately to coronavirus. For instance, CBO representatives highlighted the creation of the Portee Corona-Virus Response Unit (PoCRU), a community coordinating group composed of members drawn from several CBOs and other stakeholders to formulate and implement response strategies to prevent the spread of COVID-19. PoCRU consists of representatives of CBOs (such as the Benk Youth Organization, the Portee Millennium Youth Organization, and the Youth for Development Network), elected officials (Ward Councillors), community health personnel, and traditional leadership. However, there was no community coordinating unit in Cackle Bay like PoCRU. Instead, activities were coordinated through the FFF. The latter used its existing network of actors within and without the community to mobilise and harmonise its strategies to respond to COVID-19.

The interactions between CBOs and other stakeholders form the actor-network that is characterised by three main linkages: (i) financial and material support; (ii) risk communication and training; and (iii) mobilisation for COVID-19 risk sensitisation (see Figure 1). With regard to the first linkage, CBOs drew financial and material support from a range of collaborators, including international, state, and local actors. For instance, FEDURP Sierra Leone, with support from the Centre of Dialogue on Human Settlement and Poverty Alleviation (CODOHSAPA) and the Global Disability Fund (GDF), provided financial and material aid to CBO-led community coordinating teams to support their COVID-19 risk reduction programmes. According to representatives of CBOs, funds and items donated to the community by FEDURP were given to vulnerable groups such as people with disabilities and the elderly. The Government of Sierra Leone, through NaCSA, also made donations to communities through CBOs and community coordinating teams. CBO representatives also reported financial support from benefactors such as former and present Members of Parliament and some overseas residents. As a representative of the Mafengbeh Artist Union in Cockle Bay reported:

Figure 1. CBO actor-network and linkages/flows in COVID-19 responses



We have received financial support from our Member of Parliament, and some people from the community who are well to do. For instance, one community member presently living overseas sponsored us to do a sensitisation song for COVID-19.

As for the second linkage, there was a flow of information about the pandemic and guidelines on COVID-19 safety protocols from the Ministry of Health and Sanitation and the Health Unit of Freetown City Council to CBO coordinating teams. COVID-19-related information sourced from national institutions (such as the Ministry of Health and Sanitation) and national media outlets was further disseminated to community members by community volunteers mobilised by the CBOs. Representatives of CBOs interviewed emphasised that relying on such sources ensured that the information received by community members was credible and fact-based, helping them to reduce health risk misinformation. For the most part, CBOs drew on past experience in devising communication strategies within their networks. The Chair of Rokupa-Portee Wharf said:

The lessons we learnt [from the Ebola outbreak] have helped us to only rely on the national media and expert institutions for information concerning the virus [COVID-19] as there are a lot of fake news making rounds on social media concerning the virus. We also use channels that are widely available to our partners and residents to convey risk information and in forms that are easily understood and credible.

Other communication methods also enabled the flow of risk information, such as formal letters and telephone calls to solicit assistance from benefactors and health professionals, and the use of social media platforms, especially WhatsApp. A representative of the Youth for Development Network recounted in an FGD that:

We use social media platforms such as WhatsApp to reach team members because that is the only way information can be shared and issues discussed quickly in the present situation. Any news or information from the government can be conveyed to the team members and community members through this platform.

Lastly, with respect to the third linkage, CBO representatives explained that traditional and religious leaders in the communities were contacted to assist in mobilising volunteers to undertake COVID-19 sensitisation activities. Churches, mosques, and traditional leaders provided a supportive pool for the recruitment of volunteers who served as mediums for the flow of information and the distribution of donated items to the most vulnerable residents.

To enhance the effectiveness of the sensitisation exercise, CBOs connected with public health agencies to offer training to volunteers. That is, public and community health personnel of Freetown City Council (Health Unit) trained community volunteers to conduct properly a COVID-19 sensitisation exercise. As noted by community health personnel, health experts served as conduits of specialised knowledge for the actor-networks. A public health worker in Cockle Bay recalled:

We were contacted by [the] FFF to provide some training to volunteers who were at the forefront in the sensitisation exercise. This was important because we have to make sure that those carrying the message to the people are well-informed in the protocols.

Tensions in the CBO network in tackling the COVID-19 response

Although discussions with CBO representatives indicated that collaborating with other stakeholders in addressing the COVID-19 pandemic had been quite successful, four main tensions emerged. First, there were disagreements on task sharing and leadership. This situation was present in Cockle Bay, where there is no established community team like PoCRU to fulfil a coordinating role. This often led to various CBOs not being fully cooperative. Some NGOs, especially those that are cognate organisations of international NGOs, preferred to work separately rather than with the CBOs.

Second, there were difficulties in accessing local political representatives (such as parliamentarians) or state experts in specialised institutions for support due to laborious formalities or bureaucracy.

Third, there were misconceptions about perceived individual gains for CBOs. That is, some CBOs were more interested in the material and personal benefits to be accrued through their participation in collaborative efforts, especially when international development actors or state agencies are involved. A representative of the FFF in Cockle Bay stated:

Some CBOs join the work not because they want to help [with the COVID-19 response] but because of what they would get into their pockets. So, when they see that we are working with expatriates or those in high authority, they think that you are benefiting from the work. Then they will be asking you what you got from this person and all that. Some of us are doing this not because of any benefits but for the love of the community, but others, want to see what is in there for them.

Fourth, CBO representatives also mentioned that some NGOs embarked on separate sensitisation activities without consulting existing community-level coordinating structures and response teams (such as traditional leaders, CBOs, and coordinating teams). They highlighted that these parallel actions amounted to duplication of efforts and affected the prudent use of resources, especially in view of the valuable resources that these NGOs had at their disposal. A member of the CBO coordinating team claimed that because some NGOs did not engage with existing community-level structures, the cooperation of residents was limited. In the words of a representative of the Elite Youth Organization:

There was one NGO that came to do sensitisation here [Cockle Bay]. They just came, picked a few people around to help them do sensitisation, and started posting flyers around. They did not engage with the Chief, Ward Councillor, and our COVID-19 coordinating team. As a result, most people did not pay attention to them.

To resolve the first and third tensions that arose between actors, CBO members of community coordinating groups—such as the FFF and PoCRU—sought the intervention of Ward Councillors (that is, elected community representatives within the local government structure) at meetings to address misunderstandings through dialogue. In other instances, leaders of coordinating CBOs (such as the FFF) engaged with their counterparts individually to explain and clarify any misunderstandings. However, these attempts were not always successful, leading to the non-involvement of some members. A representative of the FFF remarked:

We engage the Ward Councillors who chair our coordinating meetings to address any disagreements. Often, I engage leaders of CBOs individually through one-on-one meetings to provide further explanations on any misgivings. However, if tensions are rife and disagreements are sharp, we just ignore them and work with those ready to go ahead with our [COVID-19] programmes.

According to CBO representatives, regular telephone calls and in-person visits to local political figures occasionally yielded some results in tackling the second tension. And they said that they were unable to address the fourth tension because they could not compel NGOs to cooperate with them. However, they felt that working together would have improved and increased the impact of their efforts.

Discussion

This study revealed how CBOs' problematisation of health disaster risks in vulnerable communities shapes the precautionary and coordinated actions of community actors. The underlying socioeconomic challenges of Cackle Bay and Portee residents influenced perceptions of COVID-19 as a communal risk requiring a CBO-led collective response—made possible by their knowledge and experience of previous health disasters. The CBOs' COVID-19 responses were group intervention-driven, which enhanced social cohesion and encouraged peer-based self-organising in communities confronting health disasters such as coronavirus. Consequently, appreciating communal perceptions of health risk such as COVID-19, a community's history of health disasters, and how such a past engenders collective and coordinated interventions among community actors is imperative for building community resilience to health disasters (Welton-Mitchell et al., 2018). In the two case study areas, the health disaster experience of CBOs, woven into the fabric of community life, influenced the problematisation of COVID-19 and community responses. As noted by the representatives of CBOs, their organisations drew on crucial lessons from the Ebola crisis in Sierra Leone (2014–16) to make appropriate adjustments to prepare for and respond to the COVID-19 pandemic. And past experiences of health disasters influenced CBOs' participation in joint community groups such as PoCRU and FFF-led COVID-19 risk reduction activities. This demonstrates that a better recall of past

experiences of disasters, together with CBO empowerment, can help to guide community response measures (Becker et al., 2017). For state actors, this can help to contextualise and localise interventions, build trust, and lead to communities and their actors being treated as partners and not barriers to health disaster response measures (Sharpe, 2016; Enria, 2020).

In Cockle Bay and Portee, although CBOs were the main agents in community-level responses to COVID-19 risks, they developed diverse linkages, including in relation to financial and material support, risk communication and training, and mobilisation for coronavirus risk sensitisation. This study also points up emergent tensions in the connections that characterised the collective community processes to address COVID-19 health disasters in Cockle Bay and Portee. Although CBOs benefited from associations with community and state actors, tensions emerged during the processes of defining and firming up the roles of some community actors in the joint COVID-19 responses. These processes, often termed *intéressement* (interposition) (Callon, 2007), illustrate how self-interest and competition among actors can engender tensions in an actor-network. For example, the joint response to the COVID-19 pandemic was largely affected by misconceptions about personal gains, as opposed to being about true volunteerism by some CBOs. Considering these difficulties, the task of engaging some actors in defined roles proved difficult and resulted in a series of ‘loose’ networks of wavering actors unwilling to commit firmly ahead of clear financial propositions—particularly in Cockle Bay, where there was no community coordinating team. Despite mediation by Ward Councillors and dialogue, there was discontent among some actors, which can further impair the emergent actor-network (Rydin, 2013).

In addition, the tensions between CBO coordinating teams and some NGOs regarding duplication of sensitisation efforts lend credence to the observation that workings within the NGO system sometimes ignore community knowledge and experiences of health disasters (Bolten and Shepler, 2017). This perpetuates ineffective and unresponsive interventions (Camara et al. 2020), and points to the persistent issue of resource capture by cognate organisations of international NGOs from CBOs, which are often in a better position to implement health disaster responses effectively (Ibrahim and Shepler, 2011; Shepler, 2017; Wilkinson, 2020). Hence, the actor-network for COVID-19 responses is characterised by multiplicity and complexity—akin to other public health interventions (Bilodeau and Potvin, 2018; Bilodeau et al., 2019).

Nonetheless, CBO-driven actor-networks are crucial for maintaining cooperation and cohesion within communities and managing networks at the community level. What is more, addressing challenges in actor relationships might require understanding of the factors that produce these tensions and how to create new channels for exchanging knowledge, ideas, and influence (Callon, 1986; Latour, 2005; Venturini, 2010; Riggs et al., 2020). This reinforces, therefore, the need for CBOs to participate in government decision-making processes that are aimed at tackling health

disasters such as coronavirus and to integrate their response strategies and activities into the overall response to COVID-19 in Sierra Leone. Here, CBOs' participation can help to support the government in developing a comprehensive understanding and response to health disasters at the community level. CBOs will also benefit by gaining consensus on priorities within actor-networks, comprehending how they can adjust their operations in support of community priorities to remain relevant, and survive (Piovesan, 2020), and identifying resources for meeting the needs of the community (Riggs et al., 2020). Overall, our results show that there is strong potential for CBO-driven actor-networks in Freetown to work collaboratively towards addressing health disasters.

Conclusion

CBOs are indispensable to global and national efforts aimed at responding to exposure to health disasters such as the COVID-19 pandemic and their impacts on disadvantaged communities. While the role of CBOs in building local resilience to environmental and health risks is well acknowledged, it is not yet clear empirically how they are coordinating local responses in the face of the COVID-19 pandemic in informal settings. Using ANT, our study has shed light on how CBOs draw on previous experience of health disasters to problematise the urgency of community-level action to deal with health disaster risks. It demonstrates that this shared understanding of coronavirus as a community risk compelled CBOs to form networks with local and state actors to sensitise their communities about the pandemic. However, the tensions, misunderstandings, and the internalised nature of the existing networks should inform disaster management practice and encourage the research community to evaluate the role of CBOs in building resilience to current and future health risks in vulnerable contexts. In sum, our study asserts that in disadvantaged communities, CBOs are better placed to co-design and implement strategies to confront health disasters.

This study thus provides evidence that supports the argument that CBOs play an important part in mitigating health disasters through their efforts to co-produce risk knowledge and minimise associated risks by integrating local networks into the health disaster response. It is also evident from the work that the capacity of actors within CBOs' networks is critical, particularly when responding to health-related disasters. It is important, therefore, for governments and policymakers to promote technical support, financial assistance, and training activities. CBOs should also take further steps to improve their communication channels with other relevant local actors, which can maximise the outcomes of their health disaster responses in informal settlements. Future research could test quantitatively the four identified thematic networks in this study to ascertain the strengths and weaknesses within these ties and the extent to which they influence local community preparedness, readiness, and recovery from health disasters.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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