

**Actor-Network Analysis of Community-Based Organisations in Health Pandemics:  
Evidence from Covid-19 Response in Freetown, Sierra Leone.**

**Louis Kusi Frimpong, Seth Asare Okyere, Stephen Kofi Diko, Matthew Abunyewah, Michael Odei Erdiaw-Kwasie, Tracy Sidney Commodore, Daniel Oviedo Hernandez and Michihiro Kita**

**Abstract**

Freetown is confronted with health-related risks that are compounded by rapid unplanned urbanisation and weak capacities of local government institutions. Addressing such community health risks implies a shared responsibility between government and non-state actors. In low-income communities, the role of Community-Based Organisations (CBOs) in combatting health disasters is well-recognized. Yet, empirical evidence about how CBOs have drawn on their networks and coordinated community-level strategies in responding to the Covid-19 pandemic is scant. Based on a qualitative study in two informal settlements in Freetown, this paper draws on actor-network theory to understand how CBOs problematize Covid-19 as a health risk, interact with other actors and the tensions that arise within these actor networks. The study findings show that community vulnerabilities and past experiences with health disasters such as Ebola informed CBOs' perception of Covid-19 as communal emergency. In response, CBOs coordinated sensitization and mobilization programs by relying on a network of internal and external actors to support Covid-19 risk reduction strategies. Nonetheless, misunderstandings among actors caused tensions in the actor-network. The study suggests that creating new channels for knowledge exchange and building on CBO capacity can help strengthen actor networks in communities and combat current and future health disasters.

**Keywords:** Actor-network theory, Community-based organization, Covid-19, Freetown, Health disaster, Local Responses

**1. Introduction**

Cities are hotspots of health disasters. In 2018 alone, there were about 96 infectious diseases outbreaks reported in various towns and cities in Africa, of which 85.4% were epidemic-prone diseases, with cholera being the most commonly reported disease (Mbousso et al., 2019). Ebola (2014-2016), for example, became West Africa's most dangerous epidemic in history at the time, claimed 11,000 lives largely due to systemic challenges in socio-economic, political, and ecological aspects of health disasters (Ifediora & Aning, 2017). Presently, the Covid-19 pandemic represents the continent's major health disaster hazard. Africa's confirmed cases and deaths stood at 4,218,239 and 112,170 respectively by March 29, 2021, 7:27 GMT (WHO, 2021).

Complicating matters further, cities in sub-Saharan Africa are considered one of the most vulnerable to health disasters due to old but persistent structural ills of 'urbanisation without development' (Boadi et al., 2005, p. 465), inadequate planning for health disasters (Cobbinah et al., 2020), lack of integration of urban planning and public health interventions (Anafo et al., 2021), and deficits in basic infrastructure such as water and sanitation (Satterthwaite et al., 2019; UN-Habitat, 2020). These persist amid weak governance systems— characterized by ineffective planning and coordination with sector agencies—

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/disa.12508](https://doi.org/10.1111/disa.12508).

and inadequate resources to proactively confront 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 on mortality (Obeng-Odoom, 2020). Yet, while the fatality rate of the pandemic on the African continent pales in comparison with the USA or Europe, emerging evidence points to potential long-lasting effects on livelihoods and human settlements that are already facing severe vulnerabilities (Kamalipour & Peimani, 2020; UN-Habitat, 2020). Given that the majority of Africa's urban population resides in informal settlements where existing socio-spatial vulnerabilities persist (e.g., poverty, marginality, water and sanitation deficits, overcrowding, poor housing conditions) persist (Kita et al., 2020), the 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 will require immediate actions as historical precedence shows such areas are severely impacted by health disasters (Ezeh et al., 2017; Kamalipour & Peimani, 2020; Satterthwaite et al., 2019; Smit, 2020). Consequently, the UN-Habitat, in its first report on Covid-19 in African cities, called for contextualized measures that target informal settlements through community-based organisations (UN-Habitat, 2020).

The recommendation from the UN-Habitat is underpinned by the realization that reducing community vulnerabilities and improving the capacity of communities and organizations builds resilience to health disaster risks (Sherr et al., 2016). The role of community-based organizations (CBOs)— herein defined as organizations that are driven, governed, and constituted primarily by residents to advance development in their domicile community— in addressing health challenges pervade the community development literature (Gilmore et al., 2020; Rezaei et al., 2019)(Grandisson, Hébert, & Thibeault, 2014; Osuteye, Koroma, Macarthy, Kamara, & Conteh, 2020; Wouters, Van Damme, van Rensburg, Masquillier, & Meulemans, 2012). More particularly, in marginalized and disadvantaged communities where essential services are largely neglected by local and state authorities (Chigbu & Onyebueke, 2021; Okyere, 2018), 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 socio-political, economic and technical factors that manifest not only in structural deficiencies in health infrastructure and management systems (Jacobsen et al., 2016), but also, as distrust in governance and international epidemic response system that often ignores community history, knowledge and experiences, and actors (Bolten & Shepler, 2017). Drawing on ethnographic methods, recent scholarship has highlighted the important role of community actors to 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 network of community volunteers and organisations 'solved problems and allowed things to run' through screening and sensitization. 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 terms of food and water to limit the potential impact on the urban poor.

While such studies offer insights into responses of community organisations to recent health disasters in the case of Covid-19, it is still unclear how CBOs have utilized their networks to respond to the pandemic at the community level. Additionally, 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 in national and global Covid-19 planning and emergency response (Conteh et al., 2021). Consequently, this paper uses Actor- Network Theory (ANT) based analysis to shed more insights about CBOs coordinating and networking activities as part of Covid-19 risk reduction in highly vulnerable informal settlements. This is relevant from two perspectives. First, CBOs' interactions with Covid-19 through their coordinating and networking activities to respond to this health disaster represents the embedded risks of and in actor-networks emanating from the interaction of actors (see Haug 2012; Healy, 2004)—in this case, Covid-19 and CBOs. Secondly, studying CBOs response 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 respond to the Covid-19 pandemic in poor urban communities in Freetown through their actor networks. Specifically, it provides insights about how CBOs viewed the Covid-19 pandemic, their networks with community actors to respond to the pandemic and the tensions that emerged in such networks. The study also reflects on lessons for disaster management communities to enhance CBOs role in building community resilience to health disaster risks and vulnerabilities. Following this introduction, section 2 provides a literature review of CBOs and health disasters. While Section 3 highlights the theoretical underpinnings of the study, Section 4 and 5 describe the study context and the methodology adopted. The results, discussion and conclusions are presented in Sections 6, 7, and 8, respectively.

## **2. Communities, Community-Based Organizations and Health Disasters**

Previous health disasters have revealed that governments and external actors have often taken action with little to no community input (Marston et al., 2020). Yet lessons from the Ebola epidemic and Covid-19 pandemic reveal the central role of communities in addressing health disasters (Gillespie et al., 2016; Gilmore et al., 2020; Pedi et al., 2017). Indeed, making communities central to interventions minimized the antagonism that many Ebola response teams faced in West Africa (Camara et al., 2020). Such revelations have helped shift perceptions of communities from barriers to partners of health disaster interventions and the emphasize strengths of communities rather than vulnerabilities (Enria, 2020; Plough et al., 2013). Additionally, communities comprise actors who have knowledge about local contexts, social and political dynamics and structures, as well as the cultural nuances that can help frame understanding and response strategies (Conteh et al., 2021; Corburn et al., 2020; Gilmore et al., 2020; Osuteye et al., 2020).

Consequently, scholars emphasize engaging community actors to improve understanding and response to health disasters (Camara et al., 2020; Wilkinson, 2017). In the absence of such engagements, Camara et al. (2020) observed that interventions were ineffective and unresponsive. From this, engaging communities in health disasters is not only critical but legitimate and essential for community and health system resilience (Camara et al., 2020; Wilkinson, 2017; Wilkinson, 2020). The benefits include helping to reduce community reluctance, identifying appropriate and urgent actions to reverse

outbreak, reducing community-humanitarian actor tensions (Camara et al., 2020), addressing misinformation and barriers to behavioral changes (Enria, 2019; Geiger et al., 2020), building trust, obtaining community buy-in, and the localization and effective implementation of response strategies (Enria, 2020; Geiger et al., 2020). More importantly, it strengthens relationships among actors and makes interventions context-specific while moving control and ownership from external actors to communities (Leach et al., 2020; Toppenberg-Pejcic & Gamhewage, 2019).

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 weak governance apparatus to address community challenges (Clark-Ginsberg et al., 2020; Post et al., 2017). In their review, Gilmore et al. (2020) identify six actors in the Covid-19 literature, including traditional, religious, and governing leaders in communities; community- and faith-based organizations; community groups; health management committees/community health committees; individuals; and key stakeholders. All these actors perform different roles in one or more stages of health disaster response (Corburn et al., 2020; Geiger et al., 2020; Osuteye et al., 2020). Indeed, the role of CBOs is evident in eleven health disasters, namely: E. coli, Ebola virus, Malaria, AIDS, Tuberculosis, Hepatitis C virus (HCV), Pandemic influenza A (H5N1), Syphilis and Avian influenza (Rezaei et al., 2019). For example, during the Ebola epidemic, CBOs were instrumental in building community trust, encouraging social and behavioral changes, 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): 1774).

Furthermore, studies from informal settlements reveal that in the absence of 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 utilized their understanding of their community to implement different strategies to fill the gaps in state and global response to health disasters in their communities (Corburn et al., 2020; Macarthy et al., 2017; 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 knowledge of their community settings make them knowledge holders and producers (Benton, 2017; Bolten & Shepler, 2017; Corburn et al., 2020), which is necessary to conceptualize 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 informal settlements during the Ebola and Covid-19 outbreak in Sierra Leone (Conteh et al., 2021; Gillespie et al., 2016; Wilkinson, 2020; Wilkinson et al., 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 the recognition of the instrumental roles of CBOs in health disaster response (Mbaye et al., 2017; Osuteye et al., 2020; Rezaei et al., 2019; Wilkinson, 2020), it is imperative to understand their operations to better inform ways to engage them successfully. One way to achieve this is to utilize the actor-network theory, which is subsequently explained in the section that follows.

### 3. Actor-Network Theory: An Overview

Generally, ANT is employed as both 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 (Bilodeau & Potvin, 2018; Latour, 2005). ANT recognizes that there are both human and non-human elements, collectively known as actants within different social contexts. These actants are assembled to understand, build knowledge, and influence the success and failures of societal processes and outcomes (Fenwick, 2010). By understanding actants and their associations, scholars develop actor-networks that characterizes actants (Latour, 2005), their influences on each other, the coalitions and alliances they form as well as their competing and/or complementary goals or agenda (Callon, 1986; Latour, 2005; Piovesan, 2020).

The scholarship on ANT encompasses critical reviews (Alcadipani & Hassard, 2010; De Munck, 2017; Fine, 2005; Murdoch, 1997; Oppenheim, 2007; Simandan, 2018; Whittle & Spicer, 2008) and ethnography approaches that uses qualitative data collection and analytical strategies to examine the processes and outcomes of societal change (Herbert, 2000; Law & 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 (Dwiartama & Rosin, 2014; Rydin, 2010). Scholars have also applied ANT to study the interactions of stakeholders in the tourism industry (Arnaboldi & Spiller, 2011; Van der Duim et al., 2013), strategic management (Bryson et al., 2009), urban planning (Boelens, 2010; Rydin, 2010; Rydin, 2013) and health-related research (Bilodeau & Potvin, 2018; Bilodeau et al., 2019).

Across these contexts, ANT as an analytical framework has suffered some level of criticisms from different scholars. To Whittle and Spicer (2008), ANT assign intentionality to non-human elements of an actor network and suffers inadequate conceptualization of the differences between structure, agency, and intentionality. De Munck (2017) also argues that ANT lacks 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.

Despite these criticisms, the use of ANT in health research continues to gain prominence due to its ability to provide insights into intersectoral actions and associations among community social systems and how they impact residents' health (Bilodeau & 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 & Potvin, 2018; Bilodeau et al., 2019). It also provides a framework to understand how intersectoral actions are produced and how associations among community needs, culture, and history of communities are crucial for linking process and effects of intersectoral action to improve resident's health and living environments (Bilodeau & Potvin, 2018; Bilodeau et al., 2019; Lehoux, 2006). Neisser (2014) also demonstrated how ANT is a relevant tool for disaster risk planning and management. Yet, the use of a network approach to understanding CBOs activities during health disasters is limited. This study therefore makes a contribution to the extant literature by using ANT to examine CBOs' response to the Covid-19 pandemic.

#### 4. Study Context

##### 4.1 Sierra Leone and Freetown City

Sierra Leone is located in the West African sub-region, bordering Guinea to the north and east, Liberia to the South and southeast and the Atlantic coast to the West. It has a population of about 7.1 million people (Statistics Sierra Leone, 2017; UNDP, 2019). Civil war (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 within 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 (Conteh et al., 2021; Lynch et al., 2020; Shepler, 2017; Yamanis et al., 2016). Even in international public health response, Wilkinson (2017) records that there is overemphasis on biomedical and technical solutions and little engagement of 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 local NGO partners of international agencies and politicians using health emergencies to enrich themselves— have deprived trusted networks of CBOs of essential resources (Ibrahim & Shepler, 2011; Shepler, 2017). Health disasters thus occur amidst mistrust of the state governance and health systems (Shepler, 2017; Yamanis et al., 2016).

Freetown city, located in the western area and the capital of Sierra Leone, has a population of about 1.056 million. The growth of Freetown has been characterized by ineffective planning and urban management, leading to poorly organized and overcrowded residential living conditions and inadequate access to basic environmental and social services (Lynch et al., 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 about 64 informal settlements in Freetown city (Koroma, Braima et al., 2018), with 70-80% of the city's labour force working in the informal sector (Rigon et al., 2020). The city's informal settlements are vulnerable to health disaster risks as they have consistently experienced outbreaks such as Lassa fever, cholera, and Ebola (Koroma, B. et al., 2021). The city was selected for this study based on (i) the vast expanse of informal settlements that are vulnerable to health disaster risks; (ii) its experience with previous health disasters (e.g., Cholera, Ebola); and (iii) the active role of CBOs in the city.

##### 4.2 Overview of COVID-19 Pandemic in Freetown

Sierra Leone's first case of Covid-19 was reported on March 31, 2020, with Freetown as the epicentre of the outbreak. As of March 29, 2021, confirmed cases were about 3,970, 79 deaths and 2,790 recoveries. The low recorded cases are attributable to the low national testing capacity (Osuteye et al., 2020). Until recently, there were only three testing laboratories nationwide with a testing capacity of 400-500 tests per day. The current testing centres have been increased to six, with a testing capacity of 1000 daily (WHO, 2021). The low testing capacity exists alongside limited health facilities, logistics and inadequate funding.

Like previous health disasters such as Ebola, Covid-19 have had a debilitating impact on the daily activities 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. The impacts of government directives on residents subsequently led to the government instituting a social protection program (e.g., emergency cash transfers) for low-wage and urban informal workers (Koroma et al., 2021). There have also been ongoing efforts to increase community preparedness to Covid-19 through engagement between CBOs, local agents of international NGOs and state actors (Osuteye et al., 2020).

#### **4.3 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, active presence of CBOs and experience with handling past disease outbreaks. Our classification of these communities as informal settlements is via housing and basic infrastructure conditions (Koroma et al., 2021; Koroma et al., 2018; Rigon et al., 2020), which is shared by local stakeholders such as the Sierra Leone Urban Research Center, experts and NGOs.

The first community, Cockle Bay, is an informal settlement located along the western coast of Freetown and approximately 5 km from the city centre. It was previously a site covered with mangrove forest and deposits of cockle. Cockle production was the major livelihood activity for most people in the area until its 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, on the other hand, is a coastal community located in the eastern part of Freetown with a population of 24,855 (Statistics Sierra Leone, 2017). Like other informal settlements in Sierra Leone, it has experienced significant population growth over the years. During the civil war, a significant proportion of displaced persons from conflict-ridden areas moved into 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 the communities. Malaria, typhoid, and cholera are the major health burdens faced by residents. Portee, for example, was doubly affected by the 2012 Cholera outbreak and amongst the worst hit by the Ebola epidemic. Informal economic activities (e.g., fishing, petty trading, and sand winning) are the predominant source of livelihood for most residents in the two communities.

#### **5. Research Approach**

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

### 5.1 Data Collection

Data collection for this research was by means of in-depth interviews. Before the interviews, the team had consultation sessions with a representative of a network of CBOs in the two communities and a local development actor with experience working with CBOs and the community leadership. The study purposively selected five CBOs from the two case regions (i.e., Cockle Bay and Portee). The selection of CBOs was based on their (i) activities as part of responses to Covid-19 pandemic in the communities, (ii) previous experience with disease outbreaks in the same communities, and (iii) the availability of their representatives to be interviewed during the time of the 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 conducting interviews. Interviews were conducted at the premises of the selected CBOs and a semi-public space within the surroundings of the coordinating CBOs in the case of the FGDs.

Overall, twenty-eight (28) individual interviews were conducted with various community actors illustrated in Table 1. The interviews lasted between 40-60 minutes. The individual interviews were augmented with one Focus Group Discussion (FGDs) in each community. The composition was equal for male (4) and female (4) participants. FDG participants were aged 20 years or above. Interviews were conducted in December 2020 by the lead author with two research assistants familiar with the communities, trained in qualitative work and also active in the local network of community organizations. Interviews were conducted in either Sierra Leonean Creole or English, based on the preference of interviewees.

**Table 1: Details of informants interviewed and sample size**

Informant	Details of informants	Position held	Type of interview	Sample
Cockle Bay				
CBO	Children Talent Education	Leader	Unstructured	1
	Elite Youth Group	Leader	Unstructured	1
	Foundation for the Future	Leader	Unstructured	1
	Mafemgbe Artist Union	Leader	Unstructured	1
	Save the Children Sierra Leone (NGO)	Leader	Unstructured	1
Opinion/ community organizations	Community Traditional group	Chief	Unstructured	1
	Women group	Leader	Unstructured	1
	Religious groups	Leaders	Unstructured	2
Experts	Councillor			1
Government official working in community	Public health workers	Staff	Unstructured	2
<b>Total</b>				<b>14</b>
Portee				



CBOs	Youth for Development Network (YDN)	Leader	Unstructured	1
	Benk Youth Organization	Leader	Unstructured	1
	Portee Millennium Youth Organization (PMYO)	Leader	Unstructured	1
	Tumara	Leader	Unstructured	1
	Portee-Rokupa Advocacy network	Leader	Unstructured	1
	Opinion/ community organizations	Representative of Wharf	Chairman	Unstructured
Experts	Community traditional group	Leader	Unstructured	1
	Councilor		Unstructured	1
	Religious	Leaders	Unstructured	2
Government official working in community	Public health workers	Staff	Unstructured	2
Total				<b>14</b>

## 5.2 Data Analysis

Data were analyzed using thematic content analysis. Following Braun and Clarke (2006) six-phase approach to theoretical thematic coding, the analysis included: (i) generating transcripts with repeated readings of the data, (ii) generating initial codes, (iii) collation of codes and search 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 discussion that follows utilize the hermeneutic principle of ‘sense making’ (Thapa et al., 2017); that is, all authors drew on illustrative quotes to identify common and salient themes with regards to CBOs activities and their networks in Covid-19 responses until saturation was reached.

## 6. Results

### 6.1. CBOs Problematization of Covid-19

Representatives of CBOs in the two communities viewed Covid-19 as a serious health emergency, although the city of Freetown and Sierra Leone had recorded comparatively few cases. This framing of Covid-19 as a serious health risk to communities by informants was informed by reports of increasing rates of infection, and fatalities, earlier in China and later in Europe and the US. In the view of representatives of CBOs who were interviewed, the Covid-19 pandemic must be treated as communal rather than individual risk, given its fast pace of transmission between people and the existing socio-economic vulnerabilities in informal settlements. CBO representatives and community leaders emphasized deficits in water and sanitation facilities, inadequate health facilities and services as among the socio-economic vulnerabilities that can facilitate the spread of the virus. Others shared that most people in informal economic activities in Freetown expressed critical concerns that made Covid-19 both urgent and a communal risk. Representatives noted:

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*).

The perceptions of Covid-19 were also shaped by previous experiences with health disasters such as the Ebola epidemic in Freetown. CBOs representatives and other community stakeholders interviewed 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 these culminated in their framing of the Covid-19 pandemic as an urgent issue requiring proactive and concerted interventions.

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 (*Women opinion leader, Cockle Bay*).

### **6.2 CBOs role in health disasters and transitions towards Covid-19 response**

Representatives of CBOs noted that their organizations predominantly engaged in sensitization and the creation of awareness about the Covid-19 pandemic. These included educating residents on its signs and symptoms, preventive measures, and treatment options. These activities were mostly done with the assistance of health practitioners, who offer training to members of the CBOs. Representatives also noted that their CBOs emphasized sensitization due to the growing tendency for misinformation and misconceptions about Covid-19 through social networks and social media platforms. Here too, interviewees drew on lessons from the Ebola epidemic, alluding to misinformation as one of the principal social factors that fueled Ebola infection rates. One representative remarked:

Our main focus on the disease outbreak [Covid-19] in our community is to sensitize 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 (*Representative of Elite Group, Cockle Bay*)

Some of the CBOs also made donations— especially sanitary items like soap, hand wash, and sanitizers— to community residents. For instance, Benk Youth Organization, a CBO in Portee, organized public fundraising to purchase sanitary items which were donated to community residents in need. From their representatives, sensitisation campaigns of CBOs are combined with other practical actions to prevent the spread of the Covid-19 among residents.

Our main focus has been on community sensitization and 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 (*Representative of Benk Youth Organization, Portee*)

Interviews also revealed that most CBOs transitioned from other development initiatives to support community responses to health risks, including Cholera, Ebola, and currently Covid-19. Elite Group in Cockle Bay, for example, was primarily a youth welfare group that focused on youth empowerment through skills development and networking. Similarly, Foundation for the Future (FFF) in Cockle Bay's primary focus was educational support for school children. However, growing susceptibility to health risks has necessitated both CBOs to extend their focus areas to tackle health disasters such as the Ebola epidemic and now the Covid-19 pandemic.

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 (*Representative of Elite Group, Cockle Bay*).

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 (*Representative of Tumara, Portee*).

These transitions to support 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 example, the Mafengbeh Artist Union Group of Cockle Bay primary focus is supporting youth in the music industry. They were, however, helping in the Covid-19 fight through composing songs that contain messages on Covid-19 impact and prevention strategies. Youth for Development Network in Portee, which is noted for youth mobilization for community development, leveraged the trust that exists between them and community youth to mobilize the youth for Covid-19 sensitization. Similarly, Portee Millennium Youth Organization (PMYO) and Elite Group, in collaboration with health experts, mobilized and trained the youth as volunteers to sensitize residents about Covid-19.

The strategy we adopted was massive house-to-house sensitization, 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 (*Representative of Elite Group, Cockle Bay*).

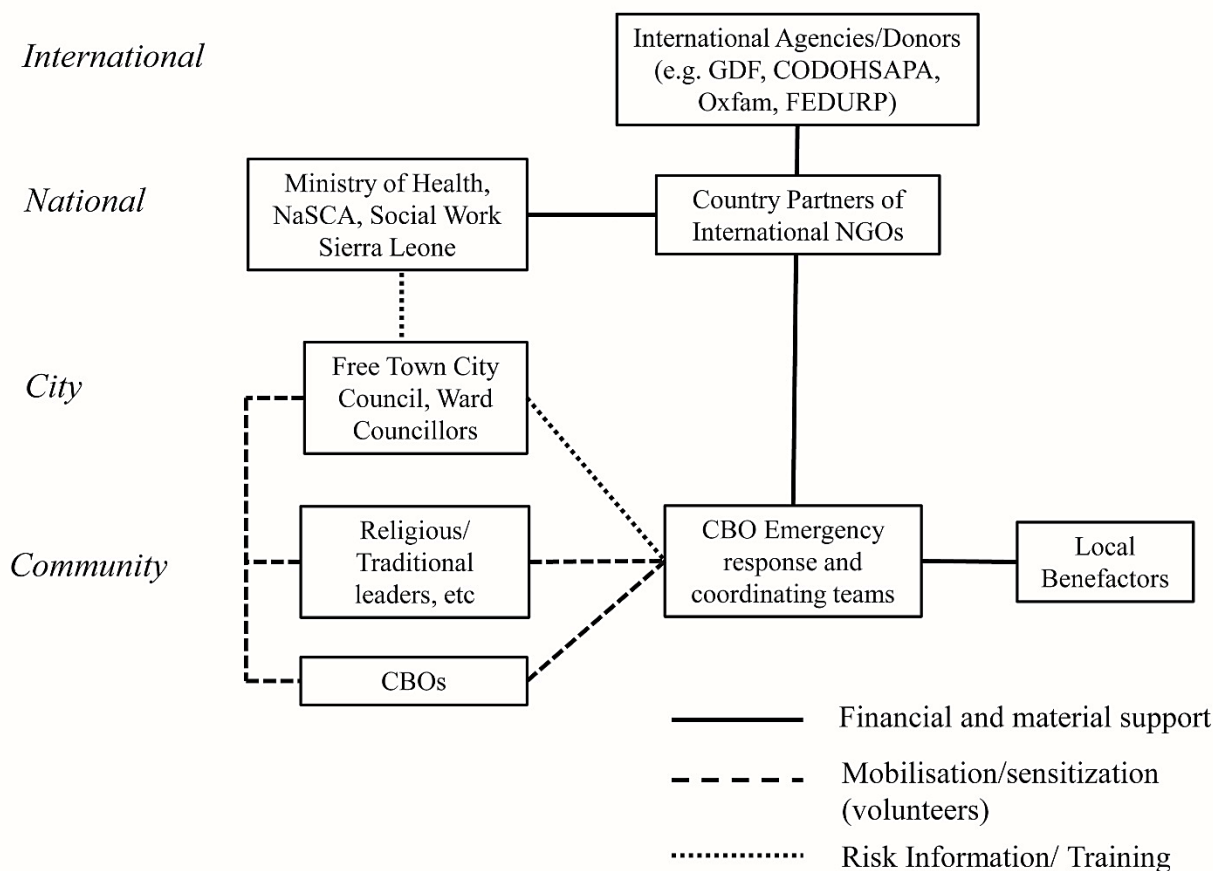
### **6.3 CBO networks, linkages and flows in Covid-19 Responses**

In the two communities, CBOs played a major role in coordinating efforts in responding to Covid-19. CBOs interacted with a range of state and non-state actors from international to community level. CBOs network of actors included international actors (e.g, Federation of the Urban and Rural Poor [FEDURP], OXFAM), central state actors (e.g., Ministry of Health and Sanitation, MHS; National Commission for Social Action, NaCSA), city-level public actors (Freetown City Council, FCC), members of Parliament, and collaborators at the community level (e.g., traditional leaders, religious groups). The interactions with these diverse actors were critical to the implementation of Covid-19 sensitization programs and the distribution of donated items to vulnerable residents in the communities.

Further, to enhance the successful implementation of Covid-19 response, CBOs and local and state actors had to form community coordinating units or teams to coordinate activities to appropriately respond to Covid-19. For instance, in Portee, CBO representatives noted that the Portee Corona-Virus Response Unit (PoCRU)— a community coordinating unit made up of members drawn from several CBOs and other stakeholders to formulate and implement response strategies to prevent the spread of the virus. PoCRU consists of representatives of CBOs (e.g., YDN, PMYO and Benk Youth Organization), elected officials (Ward Councilor), community health personnel and traditional leadership. However, there was no community coordinating unit in Cockle Bay in the form of PoCRU. Rather, activities were coordinated through the Foundation for the Future (FFF). The FFF group used its existing network of actors within and outside the community to mobilize and harmonize their strategies in response to Covid-19.

The interactions between CBOs and other stakeholders form the actor network that comprises three main linkages: financial and material support, risk communication and training, and mobilization for Covid-19 risk sensitization (see Figure 1). In terms of financial and material linkages, 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 Centre of Dialogue on Human Settlement and Poverty Alleviation (CODOHSA) and Global Disability Fund (GDF) provided financial and material aid to CBO-led community coordinating teams to support their Covid-19 risk reduction programs. According to representatives of CBOs, funds and items donated to the community by FEDURP were given to vulnerable groups such as disabled members and the aged. The government, through NaCSA, also provided donations to the communities through CBOs and community coordinating teams. CBOs representatives also reported financial support from benefactors such as former and present members of Parliament and some overseas residents, as noted by a CBO representative:

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 sensitization song for Covid-19 (*Representative of Mafemgbeh Artist Union, Cockle Bay*).



**Figure 1: CBO Actor- network and flows in Covid-19 response**

Risk communication represented another linkage in CBOs Covid-19 response networks. In this linkage, there was 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 the Freetown City Council to CBO coordinating teams. Covid-19 related information sourced from national institutions (e.g., Ministry of Health and Sanitation) and national media outlets were further disseminated to community members by community volunteers mobilized by the CBOs. Representatives of CBOs interviewed emphasized that relying on such sources ensured that information received by community members were credible and fact-based. This aided them to reduce health risks misinformation. For the most part, CBOs drew on past experiences in devising communication strategies within their networks. From one of the CBO representatives:

The lessons we learnt [from the Ebola outbreak] has 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 (*Chairman of Wharf, Portee*).

Additionally, other communication media such as formal letters and phone calls to solicit assistance from benefactors and health professionals, and the use of social media platforms, especially WhatsApp, enabled the flow of risk information. A FGD participant recounted:

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 (*Representative of Youth for Development Network, Portee*)

On mobilization and sensitization for implementing Covid-19 response strategies, CBO representatives explained that traditional and religious leaders in the communities were reached to assist in mobilizing volunteers to undertake Covid-19 sensitization activities. The churches, mosques and the social influence of traditional leaders provided a supportive pooling platform for the recruitment of volunteers who served as mediums for the flow of information and distribution of donated items to the most vulnerable residents.

To enhance the effectiveness of the sensitization exercise, CBOs linked with public health agencies to provide training to volunteers. That is, public and community health personnel from the Freetown City Council (Health Unit) trained community volunteers to properly conduct Covid-19 sensitization exercise. As shared by the community health personnel, health experts served as conduits of specialized knowledge for the actor networks.

We were contacted by FFF to provide some training to volunteers who were at the fore front in the sensitization exercise. This was important because we have to make sure that those carrying the message to the people are well-informed in the protocols' (*Community Health Personnel, Cockle Bay*)

#### **6.4 Tensions in the CBO Network in Covid-19 response**

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

The second challenge is related to difficulties in accessing local political representatives (e.g., parliamentarians) or state experts at specialized institutions for support due to laborious formalities or bureaucracy. Thirdly, there was the issue of misconceptions about the 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. One representative noted:

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 (*Representative of FFF, Cockle Bay*).

In terms of the fourth challenge, representatives of CBOs also mentioned that some NGOs embarked on separate sensitization activities without consulting existing community level coordinating structures and response teams (e.g., community traditional leaders, CBOs, and coordinating teams). For CBO representatives, these parallel activities led to duplication of efforts and affected the prudent use of resources, especially in view of the valuable resources these NGOs had at their disposal. A member of the CBO coordinating team claimed that because some NGOs did not engage existing community level structures, full cooperation from residents was limited:

There was one NGO that came to do sensitization here (in Cockle Bay). They just came, picked a few people around to help them do sensitization, and started posting flyers around. They did not engage with the Chief, ward councillor, and our COVID19 coordinating team. As a result, most people did not pay attention to them (*Representative of Elite Youth Group, Cockle Bay*).

To resolve the first and third tensions that arose between actors, CBO members of community coordinating groups—such as PoCRU and FFF— sought the intervention of ward councillors (i.e., elected community representatives within the local government structure) at meetings to address misunderstandings through dialogue. In other instances, leaders of coordinating CBOs (e.g., 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. The leader of a CBO coordinating group 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] programs (*Representative of FFF, Cockle Bay*).

## 7. Discussion

This study revealed how CBOs problematization of health disaster risks in vulnerable communities shape the precautionary and coordinated actions of community actors. The underlying socio-economic challenges of Cockle Bay and Portee residents influenced perceptions of COVID-19 as a communal risk requiring a CBOs-led collective response— made possible by knowledge and experience of CBOs on previous health disasters. The CBO's Covid-19 responses were group intervention-driven, which enhanced social cohesions and encouraged peer-based community self-organising in communities facing health disasters like Covid-19. Owing to this, appreciating communal perceptions of health risk like Covid-19, a community's history with health disasters, and how it engenders collective and coordinated interventions among community actors is imperative for building community resilience to health

disasters (Welton-Mitchell et al., 2018). Here, health disaster experience by CBOs, which are woven into the fabric of community life, influenced the problematization of Covid-19 and community responses. As noted by representatives of CBOs, their organizations drew on crucial lessons from the Ebola crisis in Sierra Leone in making appropriate adjustments to prepare and respond to the Covid-19 pandemic. Also, past experiences with health disasters influenced CBOs participation in community joint groups such as PoCRU and FFF-led Covid-19 risk reduction activities. This demonstrates that a better recall of previous experiences with disasters together with CBO empowerment can help guide community response measures (Becker et al., 2017). For state actors, this can help contextualize and localize interventions, build trust, and treat communities and their actors as partners and not barriers to health disaster response measures (Enria, 2020; Sharpe, 2016).

In both Cockle Bay and Portee, although CBOs were the main agents in community-level responses to Covid-19 risks, they developed diverse forms of linkages including financial and material support, risk communication and training, and mobilization for Covid-19 risk sensitization. This study also reveals the emergent tensions in the linkages that characterized the collective community processes to address the Covid-19 health disasters in Cockle Bay and Portee. Although CBOs benefited from linkages with community and state actors, tensions emerged in the processes of defining and firming up the roles of some community actors in the joint Covid-19 responses. This process, often termed *interessement* (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 true volunteerism by some CBOs. Considering these difficulties, the task of enrolling some actors into defined roles proved difficult and resulted in a series of ‘loose’ networks of wavering actors unwilling to firmly commit before 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).

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

Nonetheless, CBO-driven actor-networks are crucial for maintaining cooperation and cohesion within communities and to manage networks at the community level. More so, addressing challenges in actor relationships might require understanding the factors that engender these tensions as well as creating new channels for exchanging knowledge, ideas, and influence (Callon, 1986; Latour, 2005; Riggs et al., 2020; Venturini, 2010). This thus reinforces the need for CBOs to participate in government decision-making processes aimed at addressing a health disasters like Covid-19 and integrate their response



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

## 8. Conclusion

CBOs are indispensable in global and national efforts aimed at addressing the exposure and impact of health disasters such as the Covid-19 pandemic on disadvantaged communities. While the role of CBOs in building local resilience to environmental and health risks are well-acknowledged, it is empirically not yet clear how CBOs are coordinating local responses in the face of the Covid-19 pandemic in informal settings. Using the ANT, our study shed light on how CBOs draw on previous experience with health disasters to problematize the urgency of community-level action to health disaster risks. Our study showed that this shared understanding of Covid-19 as community risk compelled CBOs to form networks with local and state actors to sensitize their communities about the pandemic. However, the tensions, misunderstandings and the internalized nature of the existing networks should inform the disaster management practice and research community to evaluate the role of CBOs in building resilience to current and future health risks in vulnerable contexts. Overall, our study submits that in disadvantaged communities, CBOs are better placed to co-design and implement strategies to tackle health disasters.

This study thus provides evidence that supports the argument that CBOs play an important role in health disasters through their efforts to coproduce risk knowledge and minimize associated risks by integrating local networks in health disaster response. It is also evident from the study that the capacity of actors within CBOs networks is critical, particularly when responding to health-related disasters. It is therefore important for government and policymakers to promote technical supports, financial assistance, as well as training activities. CBOs should also take further steps to improve their communication channels with other relevant local actors, which can maximize the outcome of their health disaster responses in informal settlements. Potential future research could be to quantitatively test the four identified thematic networks of this study to ascertain the strength and weaknesses within these ties and the extent to which they influence local community preparedness, readiness, and recovery from health disasters.

### Author affiliations

**Louis Kusi Frimpong** Department of Geography and Earth Science, University of Environment and Sustainable Development, Somanya, Ghana. Corresponding author.

**Seth Asare Okyere** Graduate School of Engineering, Osaka University, Japan.

**Stephen Kofi Diko** Department of City and Regional Planning, University of Memphis, United States.

**Matthew Abunyewah** School of Architecture and Built Environment, University of Newcastle, Australia.

**Michael Odei Erdiaw-Kwassie** Asia Pacific College of Business and Law, Charles Darwin University, Australia.

**Tracy Sidney Commodore** Institute of Social, Statistical and Economic Research, University of Ghana, Ghana.

**Daniel Hernandez Oviedo** Development Planning Unit, University College London, United Kingdom.

**Michihiro Kita** Graduate School of Engineering, Osaka University, Japan.

#### **Corresponding author**

**Louis Kusi Frimpong** Department of Geography and Earth Science, University of Environment and Sustainable Development, Somanya, Ghana.

Email: [lkfrimpong@uesd.edu.gh](mailto:lkfrimpong@uesd.edu.gh)

ORCID: <https://orcid.org/0000-0002-3363-6086>

#### **Funding**

This research was supported by Konosuke Matsushita Foundation Research Grant Award.

#### **Acknowledgement**

We are grateful for the support received from our research assistants Amadu Labor, Musa Wullarie and Abdulai Kanu, who committed valuable time during and after the fieldwork. Moreover, our deepest appreciation goes to all representatives of CBOs who participated in the study for their time and insights. Special thanks to the two anonymous reviewers for their feedback.

#### **Data Availability Statement**

Data subject to third party restrictions

#### **References**

- Alcadipani, R. and J. Hassard (2010) Actor-Network Theory, organizations and critique: towards a politics of organizing. *Organization*, 17(4), 419-435.
- Anafo, D., E. Owusu-Addo, and S.A. Takyi (2021) Urban planning and public policy responses to the management of COVID-19 in Ghana. *Cities & Health*, 1-15.
- Arnaboldi, M. and N. Spiller (2011) Actor-network theory and stakeholder collaboration: The case of Cultural Districts. *Tourism Management*, 32(3), 641-654.
- Becker, J.S., D. Paton, D.M. Johnston, K.R. Ronan, and J. McClure (2017) The role of prior experience in informing and motivating earthquake preparedness. *International Journal of Disaster Risk Reduction*, 22, 179-193.
- Benton, A. (2017) Ebola at a distance: a pathographic account of anthropology's relevance. *Anthropological Quarterly*, 495-524.

- Bilodeau, A., M. Galarneau, C. Lefebvre, and L. Potvin (2019) Linking process and effects of intersectoral action on local neighbourhoods: systemic modelling based on actor–network theory. *Sociology of Health & Illness*, 41(1), 165-179.
- Bilodeau, A. and L. Potvin (2018) Unpacking complexity in public health interventions with the Actor–Network Theory. *Health Promotion International*, 33(1), 173-181.
- Boadi, K., M. Kuitunen, K. Raheem, and K. Hanninen (2005) Urbanisation without development: environmental and health implications in African cities. *Environment, Development and Sustainability*, 7(4), 465-500.
- Boelens, L. (2010) Theorizing practice and practising theory: Outlines for an actor-relational-approach in planning. *Planning Theory*, 9(1), 28-62.
- Bolten, C. and S. Shepler (2017) Introduction: producing Ebola: creating knowledge in and about an epidemic. *Anthropological Quarterly*, 90(2), 349-368.
- Braun, V. and V. Clarke (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- Bryson, J.M., B.C. Crosby, and J.K. Bryson (2009) Understanding strategic planning and the formulation and implementation of strategic plans as a way of knowing: The contributions of actor-network theory. *International Public Management Journal*, 12(2), 172-207.
- Callon, M. (1986) The sociology of an actor-network: The case of the electric vehicle. *Mapping the dynamics of science and technology* (pp. 19-34). Springer.
- Callon, M. (2007) Some elements of a sociology of translation. *The Politics of Interventions*, 57-78.
- Camara, S., A. Delamou, T.M. Millimouno, K. Kourouma, B. Ndiaye, and S. Thiam (2020) Community response to the Ebola outbreak: Contribution of community-based organisations and community leaders in four health districts in Guinea. *Global Public Health*, 15(12), 1767-1777.
- Chigbu, U.E. and V.U. Onyebueke (2021) The COVID-19 pandemic in informal settlements:(re) considering urban planning interventions. *The Town Planning Review*, 92(1), 115-121.
- Clark-Ginsberg, A., J.S. Blake, and K. Patel (2020) Hybrid governance of disaster management in Freetown, Monrovia, and Dar es Salaam. *Disasters*,
- Cobbinah, P.B., M. Erdiaw-Kwasie, and E.A. Adams (2020) COVID-19: can it transform urban planning in Africa? *Cities & Health*, 1-4.
- Conteh, A., M. Sirah Kamara, S. Saidu, and J. Mustapha Macarthy (2021) Covid-19 Response and Protracted Exclusion of Informal Settlement Residents in Freetown, Sierra Leone.
- Corburn, J., D. Vlahov, B. Mberu, L. Riley, W.T. Caiaffa, S.F. Rashid, A. Ko, S. Patel, S. Jukur, and E. Martínez-Herrera (2020) Slum health: arresting COVID-19 and improving well-being in urban informal settlements. *Journal of Urban Health*, 97(3), 348-357.
- De Munck, B. (2017) Re-assembling Actor-Network Theory and urban history. *Urban History*, 44(1), 111-122.
- Dodman, D., H. Leck, M. Rusca, and S. Colenbrander (2017) African urbanisation and urbanism: Implications for risk accumulation and reduction. *International Journal of Disaster Risk Reduction*, 26, 7-15.
- Dwiartama, A. and C. Rosin (2014) Exploring agency beyond humans: the compatibility of Actor-Network Theory (ANT) and resilience thinking. *Ecology and Society*, 19(3)

- Enria, L. (2019) The Ebola crisis in Sierra Leone: mediating containment and engagement in humanitarian emergencies. *Development and Change*, 50(6), 1602-1623.
- Enria, L. (2020) Unsettled authority and humanitarian practice: reflections on local legitimacy from Sierra Leone's borderlands. *Oxford Development Studies*, 48(4), 387-399.
- Erdiaw-Kwasie, M.O., M. Abunyewah, J. Edusei, and E.B. Alimo (2020) Citizen participation dilemmas in water governance: An empirical case of Kumasi, Ghana. *World Development Perspectives*, 20, 100242.
- Ezeh, A., O. Oyebode, D. Satterthwaite, Y. Chen, R. Ndugwa, J. Sartori, B. Mberu, G.J. Melendez-Torres, T. Haregu, and S.I. Watson (2017) The history, geography, and sociology of slums and the health problems of people who live in slums. *The Lancet*, 389(10068), 547-558.
- Fenwick, T.J. (2010) (un) Doing standards in education with actor-network theory. *Journal of Education Policy*, 25(2), 117-133.
- Fine, B. (2005) From actor-network theory to political economy. *Capitalism Nature Socialism*, 16(4), 91-108.
- Geiger, D., L. Harborth, and A. Mugyisha (2020) Managing enduring public health emergencies such as COVID-19: lessons from Uganda Red Cross Society's Ebola virus disease response operation. *Bmj Leader*,
- Gillespie, A.M., R. Obregon, R. El Asawi, C. Richey, E. Manoncourt, K. Joshi, S. Naqvi, A. Pouye, N. Safi, and K. Chitnis (2016) Social mobilization and community engagement central to the Ebola response in West Africa: lessons for future public health emergencies. *Global Health: Science and Practice*, 4(4), 626-646.
- Gilmore, B., R. Ndejjo, A. Tchetchia, V. De Claro, E. Mago, C. Lopes, and S. Bhattacharyya (2020) Community engagement for COVID-19 prevention and control: a rapid evidence synthesis. *BMJ Global Health*, 5(10), e003188.
- Haug, B. (2012) Enacting risk at Besseggen. In R. van der Duim, C. Ren & G. T. Jóhannesson (Eds.), *Actor-Network Theory and Tourism: Ordering, Materiality and Multiplicity* (pp. 95-108). Routledge.
- Healy, S. (2004) A 'post-foundational' Interpretation of Risk: Risk as 'performance'. *Journal of Risk Research*, 7(3), 277-296.
- Herbert, S. (2000) For ethnography. *Progress in Human Geography*, 24(4), 550-568.
- Ibrahim, A.F. and S. Shepler (2011) Introduction to special issue: everyday life in postwar sierra leone. *Africa Today*, 58(2), v-xii.
- Ifediora, O.F. and K. Aning (2017) West Africa's Ebola Pandemic: Toward Effective Multilateral Responses to Health Crises. *Global Governance: A Review of Multilateralism and International Organizations*, 23(2), 225-244.
- Jacobsen, K.H., A.A. Aguirre, C.L. Bailey, A.V. Baranova, A.T. Crooks, A. Croitoru, P.L. Delamater, J. Gupta, K. Kehn-Hall, and A. Narayanan (2016) Lessons from the Ebola outbreak: action items for emerging infectious disease preparedness and response. *Ecohealth*, 13(1), 200-212.
- Kamalipour, H. and N. Peimani (2020) Informal urbanism in the state of uncertainty: forms of informality and urban health emergencies. *URBAN DESIGN International*, 1-13.
- Kita, M., S.A. Okyere, M. Sugita, and S. K. Diko (2020) In Search of Place and Life in Indigenous Urban Communities: An Exploration of Abese Indigenous Quarter of La Dadekotopon, Accra. In Y. Ofosu-

- Kusi, & M. Matsuda (Eds.), *The Challenge of African Potentials: Conviviality, Informality and Futurity* (pp. 255). Langaa.
- Koroma, B., D. Oviedo, Y. Yusuf, J. Macarthy, C. Cavoli, P. Jones, L. Caren, and S. Sellu (2021) City Profile: Freetown: Base conditions of mobility, accessibility and land use.
- Koroma, B., A. Rigon, J. Walker, and S.A. Sellu (2018) *Urban Livelihoods in Freetown's Informal Settlements*. (). Freetown: Retrieved from Urban Livelihoods in Freetown's Informal Settlements
- Latour, B. (2005) *Reassembling the social: An introduction to actor-network-theory*. Oxford university press.
- Law, J. and V. Singleton (2013) ANT and Politics: Working in and on the World. *Qualitative Sociology*, 36(4), 485-502.
- Leach, M., J. Meeker, H. MacGregor, M. Schmidt-Sane, and A. Wilkinson (2020) Covid-19: Key Considerations for a Public Health Response.
- Lehoux, P. (2006) *The problem of health technology: policy implications for modern health care systems*. Taylor & Francis.
- Lynch, K., E. Nel, and T. Binns (2020) 'Transforming Freetown': Dilemmas of planning and development in a West African City. *Cities*, 101, 102694.
- Macarthy, J.M., A.A. Frediani, S.F. Kamara, and M. Morgado (2017) *Exploring the role of empowerment in urban humanitarian responses in Freetown*. International Institute for Environment and Development.
- Marston, C., A. Renedo, and S. Miles (2020) Community participation is crucial in a pandemic. *The Lancet*, 395(10238), 1676-1678.
- Mbaye, E.M., S. Kone, O. Kâ, and S. Mboup (2017) Evolution of Community engagement in the fight against Ebola. *Sante Publique*, 29(4), 487-496.
- Mboussou, F., P. Ndumbi, R. Ngom, Z. Kassamali, O. Ogundiran, J. Van Beek, G. Williams, C. Okot, E.L. Hamblion, and B. Impouma (2019) Infectious disease outbreaks in the African region: overview of events reported to the World Health Organization in 2018. *Epidemiology & Infection*, 147
- Murdoch, J. (1997) Inhuman/nonhuman/human: actor-network theory and the prospects for a nondualistic and symmetrical perspective on nature and society. *Environment and Planning D: Society and Space*, 15(6), 731-756.
- Neisser, F.M. (2014) 'Riskscapes' and risk management—Review and synthesis of an actor-network theory approach. *Risk Management*, 16(2), 88-120.
- Obeng-Odoom, F. (2020) COVID-19, inequality, and social stratification in Africa. *African Review of Economics and Finance*, 12(1): 3-37.,
- Okyere, S.A. (2018) *A study on socio-spatial structure and community management system in Abese indigenous quarter of La, Accra, Ghana. Rethinking urban informality and informal settlement improvement*.
- Oppenheim, R. (2007) Actor-network theory and anthropology after science, technology, and society. *Anthropological Theory*, 7(4), 471-493.
- Osuteye, E., B. Koroma, J.M. Macarthy, S.F. Kamara, and A. Conteh (2020) Fighting COVID-19 in Freetown, Sierra Leone: the critical role of community organisations in a growing pandemic. *Open Health*, 1(1), 51-63.

- Oviedo, D., S.A. Okyere, M. Nieto, M. Kita, L.F. Kusi, Y. Yusuf, and B. Koroma (2021) Walking off the beaten path: Everyday walking environment and practices in informal settlements in Freetown. *Research in Transportation Business & Management*, 100630.
- Pedi, D., A. Gillespie, J. Bedson, M.F. Jalloh, M.B. Jalloh, A. Kamara, K. Bertram, K. Owen, M.A. Jalloh, and L. Conte (2017) The development of standard operating procedures for social mobilization and community engagement in Sierra Leone during the West Africa Ebola outbreak of 2014–2015. *Journal of Health Communication*, 22, 39-50.
- Piovesan, F. (2020) Reflections on combining action research and actor-network theory. *Action Research*, 1476750320919167.
- Plough, A., J.E. Fielding, A. Chandra, M. Williams, D. Eisenman, K.B. Wells, G.Y. Law, S. Fogleman, and A. Magaña (2013) Building community disaster resilience: perspectives from a large urban county department of public health. *American Journal of Public Health*, 103(7), 1190-1197.
- Post, A.E., V. Bronsoler, and L. Salman (2017) Hybrid regimes for local public goods provision: a framework for analysis. *Perspectives on Politics*, 15(4), 952-966.
- Rezaei, F., M. Keyvanara, M. Yarmohammadian, and M. Maracy (2019) The Roles and Responsibilities of Community-Based Organizations in Responding to Public Health Emergencies: A Systematic Review. *Iranian Red Crescent Medical Journal (IRCMJ)*, 21(4), 0.
- Riggs, R.A., J.D. Langston, J. Sayer, S. Sloan, and W.F. Laurance (2020) Learning from local perceptions for strategic road development in Cambodia's protected forests. *Tropical Conservation Science*, 13, 1940082920903183.
- Rigon, A., J. Walker, and B. Koroma (2020) Beyond formal and informal: Understanding urban informalities from Freetown. *Cities*, 105, 102848.
- Rydin, Y. (2010) Actor-network theory and planning theory: A response to Boelens. *Planning Theory*, 9(3), 265-268.
- Rydin, Y. (2013) Using Actor–Network Theory to understand planning practice: Exploring relationships between actants in regulating low-carbon commercial development. *Planning Theory*, 12(1), 23-45.
- Satterthwaite, D., A. Sverdlik, and D. Brown (2019) Revealing and responding to multiple health risks in informal settlements in sub-Saharan African cities. *Journal of Urban Health*, 96(1), 112-122.
- Sharpe, J. (2016) Understanding and unlocking transformative learning as a method for enabling behaviour change for adaptation and resilience to disaster threats. *International Journal of Disaster Risk Reduction*, 17, 213-219.
- Shepler, S. (2017) "We Know Who is Eating the Ebola Money!": Corruption, the State, and the Ebola Response. *Anthropological Quarterly*, 451-473.
- Sherr, L., A.R. Yakubovich, S. Skeen, L.D. Cluver, I.S. Hensels, A. Macedo, and M. Tomlinson (2016) How effective is help on the doorstep? A longitudinal evaluation of community-based organisation support. *PloS One*, 11(3), e0151305.
- Simandan, D. (2018) Competition, contingency, and destabilization in urban assemblages and actor-networks. *Urban Geography*, 39(5), 655-666.
- Smit, W. (2020) The challenge of COVID-19 in African cities: an urgent call for informal settlement upgrading. *Cities & Health*, 1-3.

- Statistics Sierra Leone. (2017) *Sierra Leone 2015 Population and Housing Census. National Analytical Report*. (). Freetown: Retrieved from Sierra Leone 2015 Population and Housing Census. National Analytical Report
- Thapa, D., N.R. Budhathoki, and B.E. Munkvold (2017) Analyzing crisis response through actor-network theory: The case of Kathmandu living labs. *Communications of the Association for Information Systems*, 41(1), 19.
- Toppenberg-Pejcic, D. and G. Gamhewage (2019) Community engagement for emergency/outbreak preparedness and response: a flash survey literature review of guidance documents.
- UNDP. (2019) *Sierra Leone Multidimensional Poverty Index*. Sierra Leone, Freetown: United Nations Development Programme. [https://ophi.org.uk/wp-content/uploads/Sierra\\_Leone\\_MPI\\_2019\\_final.pdf](https://ophi.org.uk/wp-content/uploads/Sierra_Leone_MPI_2019_final.pdf)
- UN-Habitat. (2020) *COVID-19 in African cities: Impacts, Responses and Policy Implications*. Nairobi: Retrieved from COVID-19 in African cities: Impacts, Responses and Policy Implications
- Van der Duim, R., C. Ren, and G. Thór Jóhannesson (2013) Ordering, materiality, and multiplicity: Enacting Actor–Network Theory in tourism. *Tourist Studies*, 13(1), 3-20.
- Venturini, T. (2010) Diving in magma: how to explore controversies with actor-network theory. *Public Understanding of Science*, 19(3), 258-273.
- Welton-Mitchell, C., L.E. James, S.N. Khanal, and A.S. James (2018) An integrated approach to mental health and disaster preparedness: a cluster comparison with earthquake affected communities in Nepal. *BMC Psychiatry*, 18(1), 1-14.
- Whittle, A. and A. Spicer (2008) Is actor network theory critique? *Organization Studies*, 29(4), 611-629.
- WHO (2021) *WHO Coronavirus (COVID19) Dashboard*. [https://covid19.who.int/?gclid=EAlalQobChMI2Mrit8vw7gIV0VVgCh0MsQpVEAAYASAAEgLfdfD\\_BwE](https://covid19.who.int/?gclid=EAlalQobChMI2Mrit8vw7gIV0VVgCh0MsQpVEAAYASAAEgLfdfD_BwE)
- Wilkinson, A. (2017) Emerging disease or emerging Diagnosis? Lassa fever and Ebola in Sierra Leone. *Anthropological Quarterly*, 369-397.
- Wilkinson, A. (2020) Local response in health emergencies: key considerations for addressing the COVID-19 pandemic in informal urban settlements. *Environment and Urbanization*, 32(2), 503-522.
- Wilkinson, A., A. Conteh, and J. Macarthy (2021) Chronic conditions and COVID-19 in informal urban settlements: a protracted emergency. *Cities & Health*, 1-4.
- Yamanis, T., E. Nolan, and S. Shepler (2016) Fears and misperceptions of the Ebola response system during the 2014-2015 outbreak in Sierra Leone. *PLoS Neglected Tropical Diseases*, 10(10), e0005077.
- Yin, R. K. (2017) *Case study research and applications: Design and methods*. Sage publications.