Landscape and Urban Planning 217 (2022) 104256

Contents lists available at ScienceDirect

Landscape and Urban Planning

journal homepage: www.elsevier.com/locate/landurbplan

Mobilizing the social infrastructure of informal settlements in infectious disease response – The case of Ebola Virus Disease in West Africa

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HIGHLIGHTS

- Despite inadequate infrastructure, effective disease outbreak response is possible.
- Informal life plays an important yet neglected role in official outbreak responses.
- Social capital can play a key role in effective epidemic response.
- Community-based approaches are crucial to managing outbreaks in informal settlements.

ARTICLE INFO

Keywords:
social infrastructure
infectious disease
Ebola
informal settlements
West Africa

ABSTRACT

The growth of social precarity - particularly in the Global South - has meant that those living in informal settlements typically face a wide range of threats on a day-to-day basis due to the lack of basic welfare, social services and infrastructure, normally provided by the state. In the relative absence of formal infrastructures, people informally forge their own connections, capacities and opportunities so that they are able to access the social support they requirewhen needed. Recognizing this trend, this paper argues that there is a greater need for epidemic program planners to recognize and leverage the potential social infrastructure of informal communities and self-governance mechanisms during a disease epidemic. This need highlights the importance of tapping into already existing networks of social capital that can be readily mobilized during an epidemic to achieve a more rapid response. The empirical basis of our arguments draws primarily on qualitative research in informal settlements of Freetown, Sierra Leone and Monrovia, Liberia, following the 2014–16 Ebola Virus Disease (EVD) outbreaks. Our research reveals that distrust in government and inadequacies in the official response were identified as primary factors accounting for the severity of the EVD outbreaks in informal settlements. Overall, the research stresses the importance of adopting community-based approaches to infectious disease response that explicitly builds on context-specific knowledge pertaining to locally-based informal social arrangements, governance mechanisms and the local political history in which the informal settlement is embedded.

1. Introduction

The disruption of the routine functioning of society due to extreme events may lay bare social processes and circumstances that are normally taken-for-granted and unquestioned (Durkheim, 1951). These normally hidden qualities of social and institutional life become revealed in the process (Ali, 2008). For instance, the COVID-19 pandemic brought into greater relief a wide range of social fissures that did not previously receive an adequate level of public attention – such as the plight of those in long-term and medical care institutions, the challenges of precarious employment, racism, social class disparity, international health disparities and so on. In particular, the weaknesses or

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https://doi.org/10.1016/j.landurbplan.2021.104256
Received 11 November 2020; Received in revised form 6 August 2021; Accepted 15 September 2021
Available online 6 October 2021

flaws in existing formal institutions and the way they currently function became subject to increased public scrutiny during the pandemic. Conversely, as we shall discuss with reference to the 2014–2016 Ebola Virus Disease (EVD) epidemic that emerged in Liberia during March 2014 and Sierra Leone in May 2014, extreme circumstances may provide the opportunity for normally unacknowledged but relatively well-functioning informal social institutions and processes to come to the fore. In this light, we focus on how informal networks of social capital and social infrastructure that usually operate "under the radar" were overtly mobilized during the West African EVD epidemic. Notably, we contend that despite the serious challenges that arose from an under-resourced public health infrastructure (due to chronic under-investment and the ravages of civil war) and compounded by the lack of networked technological infrastructures that could provide water, electricity, sewage treatment and transportation so urgently required in emergency strategies, an effective outbreak response was nevertheless mounted. We are not suggesting that there is a dichotomy of formal and informal, "modern" and "undeveloped" infrastructures, rather we are subscribing to a view of infrastructural "heterogeneity" in cities of the Global South (Lawhon et al, 2018). With this understanding, we discuss how the informal, normally invisible infrastructures of urban communities revealed their response capacity and potential during the EVD epidemic. We argue that the effective outbreak response was possible because of the successful mobilization of social capital within affected communities. In this light, the key question informing our analysis is: h*ow did social capital enable an effective EVD response in West Africa*? This is an issue worthy of study because in responding to the urgent demands of a disaster or public health emergency, program planning officials sometimes tend to focus exclusively on material rather than social resources and capacities. This bias favours financially costly Western-based technological solutions over other possible, yet effective, responses – that is, responses that can dramatically decrease infectious disease incidence and prevalence counts, thus contributing to a quicker end to an unfolding epidemic.

While the material dimension cannot, of course, be ignored, the success of the EVD response in West Africa highlights the need for planners to give greater attention to the social dimensions of pandemic response. From a program planning perspective, this is especially important because the financial and temporal costs of constructing the necessary physical infrastructure needed to respond to the epidemic cannot be readily met in the Global South context. Moreover, as Wilkinson (2020) observes, epidemic control measures will be ineffective unless proper consideration is given to the social and livelihood impacts of the epidemic. Accordingly, an alternative and perhaps more efficient and pragmatic orientation to epidemic planning would involve efforts to actively build on elements of the existing social infrastructure and networks of social capital on the ground. In this paper, we discuss some of the ways in which the adoption of just such an orientation enabled a successful EVD response in West Africa. Interviews and focus groups in informal settlements in Freetown, Sierra Leone and Monrovia, Liberia conducted three years after the epidemic form the empirical basis of our analysis. As such, the qualitative data we collected for this study captured informants' retrospective accounts and reflections of their experiences during the EVD outbreak period.

We begin with a brief overview of our theoretical backdrop that is informed in part by the social capital perspective but more notably through recent work on informality and the social infrastructure of care. This is followed by a brief overview of the West African EVD epidemic and the somewhat unique strategy that arose in response to it, namely, the community-based response. The second section describes our study areas, while the subsequent section outlines the qualitative methodology and thematic analysis adopted for analysis. The fourth section discusses the themes identified through our analyses. The fifth section provides a substantive discussion of our findings as well as some remarks about the implications of our study for epidemic response planning more generally. Following that we give our concluding remarks regarding epidemic planning in resource-poor settings based on the mobilization of social infrastructure.

1.1. *Informal social infrastructure of care*

Following well-established Western public health protocols, the *official* EVD response involved activities related to: the establishment of case identification and contact tracing systems, and the construction of Ebola Treatment Units (ETUs) for medical treatment, clinical work and testing. Such pursuits were carried out by officials working in a formalized hierarchical command-and-control bureaucratic structure. Such an approach prioritizes the role of formal officials in the response over the contributions of all others affected. Consequently, unofficial or informal structures – those that are already in place in the community – are overlooked as a possible resource. In line with researchers who adopt a social capital framework in other domains such as resource management, primary education, urban poverty alleviation and slum development (for instance see: Chen and Beard, 2018; Das and King, 2019), as well as those who argue for the importance of delivering services based on community-oriented planning perspectives (Spencer, 2019), we argue that there is a greater need for epidemic program planners to recognize and leverage the potential social infrastructure of informal communities and self-governance mechanisms during a disease epidemic.

Compared to other development planning initiatives, epidemic preparedness planning must take into account contextual considerations. Conventional development initiatives usually operate on a longer timescale relative to the much shorter and rapid timespan necesary to respond to a situation of contagion. The mobilization of social capital during an epidemic must be done in a much quicker, more nimble manner which highlights the importance of tapping into already existing networks of social capital that can be readily mobilized. Thus, although it was not their central focus, Clark-Ginsberg et al. (2020) contrast how the implementation of the community-based strategy during the EVD response in Monrovia led to much quicker results compared to the much slower community-based process involved in responding to the risk of flooding in Freetown and Dar es Salaam. Second, consideration must be given to the fact that both Sierra Leone and Liberia are countries trying to rebuild after a recent series of devastating civil wars. The decimated health care systems in these two countries were particularly hard-hit after decades of chronic underfunding. Even a rapid influx of foreign capital would not be able to address the deeply entrenched problems faced by a wholly dysfunctional public health infrastructure (Kieh, 2017; Amos, 2017). These circumstances also reaffirm the need to focus on mobilizing the existing social infrastructure in a setting where people historically could not rely on the government and NGOs to address their health care needs and as such developed their own locally and family-based strategies to deal with these types of needs.

The growth of informality - as indicated by the increased precariousness and uncertainty in housing, work and life chances – has meant that those living in informal settlements typically face a wide range of threats on a day-to-day basis. These individuals have a shared experience that stems from: the lack of basic service provision, the continual threat of eviction from their homes, multi-faceted land and resource conflicts, and a feeling that the dominant renderings of the city's future exclude them (McFarlane and Silver, 2017). This precarious state of affairs is in part due to the absence of key provisions of the state, such as basic welfare, social services and infrastructure. McFarlane and Silver (2017) note that to cope with these difficult circumstances, people seek to improve their conditions through the development of infrastructures and practices of a different type – namely, through engagement with the informal social infrastructure. Thus, in the relative absence of formal infrastructures, people informally forge their own connections, capacities and opportunities so that they are able to access the social support they need. This focus on relationships resonates with the notion of social capital, which by one definition includes "the ability of actors to secure

benefits by virtue of membership in social networks or other social structures" (Portes 1998:6). The main components of social capital are networks, norms and sanctions (Putnam, 2000). Ostrom (2007) notes that a focus on these components may facilitate a better analytical framing of collective behaviour.[1]

The social capital perspective is of interest to us for a several reasons. First, the community-based initiatives adopted in the West African EVD response represent a form of collective action. Second, social capital has been identified as an important element of life in informal settlements because very limited access to financial and physical resources has meant that residents had to strengthen their social resources in the form of networks, mutual help and trust (Jabeen et al. 2010; Rashid 2000; Wood 1998). Forced to rely on neighbours, family, extended kin and other networks has meant that the possession and use of social capital represents a primary strategy that people use to deal with life's daily challenges and opportunities (Woolcok and Sweetser, 2002:26). For instance, reciprocal exchanges serve as the basis of informal insurance systems which enable people to lend, buy and sell between themselves (Stack, 1974). Third, aside from the importance of social capital to weather the stressors of everyday routine life, it is particularly important at times of crisis and disaster, such as during an epidemic. Social capital enables individuals, groups and communities to enhance their resilience in the face of disasters (Tierney, 2014:186). Indeed, during times of intensified crisis, social infrastructures and social capital are absolutely vital for survival (McFarlane and Silver, 2017). They provide what Klinenberg (1999) refers to as an "ecology of support" – a type of social infrastructure that serves as a safety net not only during normal times but especially during times of crisis. Klinenberg (1999) notes that in reference to the 1995 Chicago heat wave, it was the combination of community vitality, strong social ties and functioning social institutions that helped protect residents in certain neighbourhoods from the life-threatening heatwave, while other localities that lacked those attributes, suffered a much higher mortality rate. This last point highlights the importance of one form of social capital, namely, the social infrastructure of care.

McFarlane and Silver (2017) note that moments of caring are especially evident during heightened times of crisis when friends, family and neighbours are seen to come to together to secure essential needs and support each other in various capacities. Similarly, Abramowitz et al. (2015) note that public health experts often attribute changes in cultural practices related to hygiene practices, food, cultural practices and death rituals as prominent factors that shaped the community-based EVD response that was eventually adopted in West Africa. They argue that such an attribution does not however tell the whole story and that attention needs to shift to the culture of caregiving that existed in EVD-affected sites. Such a focus is particularly salient in the EVD context because caregiving for the infected requires physical contact by family members, but public health messages during the early stages did not recognize the lived reality in the West African social milieu, namely, that almost every able-bodied person serves at the very least as a part-time caretaker for children, elderly, physically or mentally disabled friends and relatives (Abramowitz et al, 2015:11).

1.2. The Ebola Virus Disease epidemic in West Africa and the Community-Based Initiative

Sporadic outbreaks of EVD over the last quarter century were limited to remote areas in Central and Eastern Africa. Due to the geographic isolation and sparse population of these rural sites, the mortality rates from past outbreaks remained relatively low (Richards, 2016:13). In contrast, during the primary epidemic periods in Guinea (January 2014 to June 2016), Liberia (March 2014 to May 2015) and Sierra Leone (May 2014 to November 2015), the three countries collectively accounted for more than 28,600 cases and 11,325 deaths (Ripoll et al., 2018).

International responders from humanitarian and global health organizations such as the World Health Organization, Médecins Sans Frontières (MSF) and other medical humanitarian nongovernmental organizations (NGOs) were mobilized in response to the epidemic (Hofman and Sokhieng (2017)). It was soon recognized however that the conventional range of medical and epidemiological responses to outbreaks were ineffective, especially in the context of an exceedingly poor health care infrastructure and community resistance to outbreak response measures (Abramowitz et al., 2015). As EVD incidence rates continued to grow at an alarming rate, the urgent need to consider alternative response strategies led to greater receptiveness of the idea of a developing a new strategy based on the merging of conventional epidemiological response with community-centred approaches more commonly adopted by those involved in humanitarian and development initiatives (Abramowitz et al., 2017:59-60). The adoption of this approach soon proved successful in curbing EVD cases in all three West African countries, thus providing evidence of the efficacy of community-based approaches in responding to epidemics (Fallah et al., 2016).

The community-based response was a multidimensional approach that involved the training of local community leaders and members in different phases of outbreak response by government and NGO officials. Activities included those pertaining to: prevention, response and treatment as well as with the aftermath (i.e. dealing with the concerns of survivors and orphans, including issues related to memorialization). The core of the community-based approach was to (1) listen to concerns; (2) involve formal and informal local leaders in the process of designing solutions; and (3) empowering and training community members to become actively involved in surveillance efforts (Schreiber et al., 2017:12). The community-based response included activities such as properly caring for and isolating the infected, safely managing quarantines, safely transporting the sick to ETUs, safely isolating and burying the deceased, training others to properly maintain household hygiene and establishing a community-based infrastructure to care for people – for example to provide food and water, assistance supplying chlorine, water and washbasins, and to provide support for those who care for quarantined family members as well as by conveying messages and communicating with extended family (for a detailed discussion see Abramowtiz et al, 2015).

The types of local leaders mobilized by the community-based initiative varied between the affected countries. In Guinea, elders and youths were mobilized, while in Liberia engagement was with NGO-affiliated leadership structures and in Sierra Leone, regional and local chiefs were mobilized (Le Marcis et al., 2019). Some of these differences can be understood to be the result of different historical trajectories. For instance, in Guinea, the influence of youth leaders and elders can be traced to instances of state violence and disregard of the population, especially aggression towards indigenous animist groups (Le Marcis et al., 2019). In response, a well-developed youth movement formed in the country to counter such developments. Historically, youth groups formed to monitor and protect local Guinean villages from incursions emanating from neighbouring Sierra Leone and Liberia during the 2000s. The Guinean army was seen as ineffective in protecting its own people against rebel incursion from the neighbouring countries and this served as a stimulus for youth groups to take on a protective role. At the same time, elder councils retained traditional legitimacy that conferred authority within the predominantly Kissi region – though as Le Marcis et al. (2019) document, there existed some tension between the youth the elder groups. In the case of Liberia, the influence of NGOs in the EVD response can be traced to the civil war period in the 1990s that led to a proliferation of NGOs in that country (Tiepoh. n.d.). Thus, in 1991 there were at least 20 major international NGOs operating in Libera that

[1] McFarlane and Silver (2017) distinguish the concepts of social infrastructure (which they introduce) with networked social capital, arguing that networked social capital perspective tends to focus solely on the economic potentials of social collectives, rather than the wider set of ways in which people manage their daily existence.

became increasingly involved in service provision, including those related to health care needs.

At the same time, these differences in community mobilization may reflect the enduring influence of particular colonial policies– French direct rule in Guinea, British indirect rule in Sierra Leone, and indirect domination through U.S. foreign investors and Americo-Liberians in Liberia (Howard, 2017). Thus, in the case of Sierra Leone, a "community ownership model" in which chiefs were actively involved was in place since the civil war, to protect communities from outside intruders and government forces. During the EVD epidemic in Sierra Leone, the key community mobilizers were chiefs and their role in the community-based response were ultimately accepted because of the respect for the authority of the chieftaincy. As a community member remarked in a study by Le Marcis et al. (2019:28): "Our people do not know government … it is only the chief they know". In the case of Liberia, local leaders were recruited from long-established and well-reputed NGOs, as well as students and teachers in the community, the head of youth groups and traditional and religious leaders of all ages. Notably, even before the formal adoption of the community-based initiative, some citizens and local leaders organized themselves into community task forces and implemented their own quarantine initiatives, including visits, food and financial support (for details see Le Marcis, et al., (2019) for Sierra Leone and Schreiber et al. (2017) for Liberia). In fact, it was the success of such *ad hoc* initiatives of community task forces that served as the inspiration for the community-based approach to be adopted on a larger scale across all communities in Liberia. This process was facilitated through enhanced collaboration between government and NGO response officials and communities, first in the informal settlement of West Point, then in other regions (Fallah, et al., 2016). As discussed later, once the community-based strategy was adopted, the leaders involved in such local initiatives served as intermediaries between the community and the government officials involved in the response.

2. Study areas

The capital cities of Monrovia, Liberia and Freetown, Sierra Leone are both located off the Atlantic Ocean (see Fig. 1). The 2020 population of Monrovia was 939,524 (PopulationStat, 2021a), while Freetown's population for the same year was 1,202,000 (PopulationStab, 2021b). Both cities have sizeable port facilities and international airports (Richards, 2016: 40).

2.1. West Point informal Settlement, Monrovia

Among the more than 20 informal settlements in and around Monrovia, the largest is West Point - supporting a population of 80,000 residents who livie in an area that is less than one-half square kilometers (Schreiber, Leon, Widner, & Jennifer, 2017). The land on which West Point is situated is owned by the municipality but the community has been granted a Squatters Right License which gives the government the power to evict residents from the land at any time (Cole 2008). The settlement has more recently been referred to as a "post-civil-war urban 'ghetto'" and was popularly known to be a refuge for ex-combatants of the civil war, despite the fact that the vast majority of the inhabitants were not ex-soldiers (Richards, 2016: 134). Media accounts nevertheless typically characterized West Point as having high levels of violence and crime associated with the drug trade. Residents themselves believed that their needs have been ignored in discussions about how social services and development initiatives should be adopted and pursued (Benton,

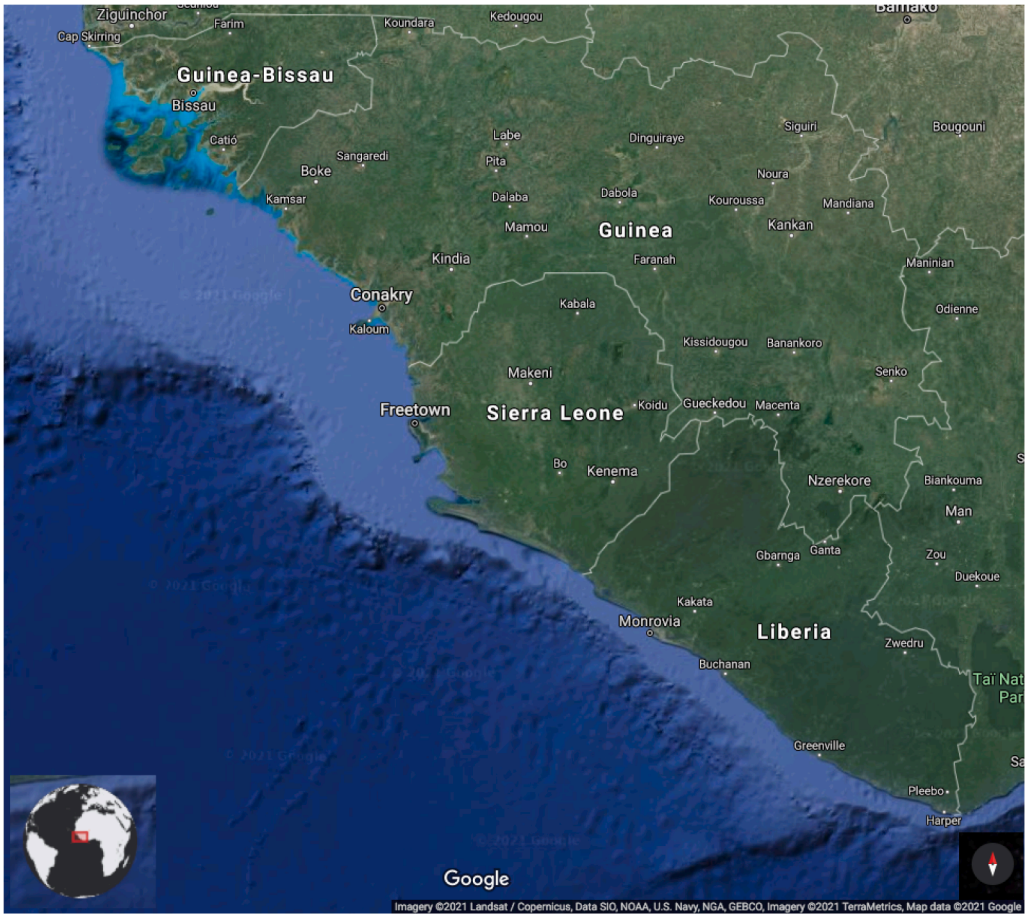

Fig. 1. Map of Guinea, Liberia, and Sierra Leone. Source: Google Maps. Source: Google Maps. Retrieved August 8, 2021.

2017; Woskie and Fallah, 2019), while further noting that most crimes committed in West Point were in fact perpetrated by outsiders (Cole, 2008).

The West Point Commissioner – appointed by the Minster of Internal Affairs – leads a council of tribal leaders and elders who serve as the local governing body for the community. The council coordinates its activities with a network of other organizations operating within the community.

However, there are other groups that operate somewhat autonomously. For instance, there are youth organizations that consistently perform environmental cleaning and hygiene work. These youths are supported by the Liberian Maritime Authority on an ongoing basis to maintain and clean the beaches. Kru is the dominant ethic group but those from other tribes - Lorma, Vai, Greebo, Kissi, Kpelle and Mende – also reside there (ibid). Cole observes community pride and a feeling of belonging as drivers of various projects in West Point (2008: 17), qualities that were mobilized by the community-based response to EVD despite a troubling incident that took place in the informal settlement (Fallah, 2016: 367): During the early stages of the epidemic spread, government officials feared that EVD spread within West Point would be catastrophic (Schreiber, Leon, Widner, & Jennifer, 2017). To deal with this possibility, the government without advanced notice, established a police and military blockade at the only point of entry/exit to West Point to enforce a quarantine. This led to a tense confrontation between police and military officials stationed at the checkpoint and residents who felt unfairly trapped as they were denied their ability to earn a livelihood and obtain food. As the situation escalated, gunfire by officials led to the tragic death of one young boy (Fig. 2).

2.2. *Dwarzark informal Settlement, Freetown*

Dwarzark is one of the largest informal settlements in Freetown. It is a typical hillside settlement covering an area of 126 ha with an estimated population of over 16,500 (SDI, 2017). High population concentration is found in this area with several buildings clustered together and separated only by narrow footpaths. A few NGOs usually intervene in Dwarzark on a range issues related to health and well-being. Over the years, these programs have worked to improve the lives of residents and their community. There are also groups who often lead local-level actions to improve their community. This often includes youth-led initiatives which focus mostly on cleaning of the environment including the clearing of drainage ways to reduce disaster risks. Local community structures in Dwarzark are commonly considered to be well organized (Koroma et al., 2018). For example, in response to the continued rise in disaster events in the city, community leaders and a few youths actively engaged the government and some NGOs to set up a Community Based Disaster Management Committee (CBDMC) and Community Health Workers (CHW) unit in Dwarzark. The local and central governments have also been able to provide Dwarzark with some services (school, electricity and a public health unit) including connecting it with Freetown through a tarred road (Fig. 3).

3. Methodology

This research was part of a larger project focused on the deployment of community-based initiatives during the 2014–2016 EVD outbreaks in Sierra Leone and Liberia. The objective of the larger project was to adapt what was learned from the West African experience to help train officials in the Democratic Republic of the Congo in the community-based approach as they engaged in response efforts during the 2018–2020 EVD epidemic. Thus, the interview and focus group questions were geared towards that objective and included questions such as: “Tell us about how Ebola affected your community, what changes did it cause during the outbreak and after the outbreak?” What aspects concerning the Ebola response made you feel bad and why?” What in your opinion was good about the Ebola response?” “In what way did you resist or facilitate the response?” Although interviews and focus groups were conducted at 10 different regional sites (5 in Liberia and Sierra Leone respectively), for the present analysis we select out the focus group discussions conducted in the two largest urban informal settlements –

Fig. 2. West Point Informal Settlement, Monrovia (Credit: S.H. Ali).

Fig. 3. Dwarzark Informal Settlement, Freetown (Credit: S.H. Ali).

Dwarzark in Freetown and West Point in Monrovia. These locations were also chosen because they represented known hotspot areas for Ebola spread.

The West Point community is well known to one of the researchers (Fallah) who grew up in the community and was involved in the Ebola response in the capacity of the Incident Management System lead (responsible for case investigation and contact tracing). We held a 90-minute focus group discussion in October 2019 in West Point and recruited through community leaders who helped enlist participants from survivors, caregivers of Ebola cases, family members of deceased cases, and response workers. All participants were above 18 years of age and all focus groups involved ten participants.

The Dwarzark community is well known to one of the authors (McCarthy) having worked there for close to three years before the project. Two focus group discussion sessions were held there. The participants were selected purposively from among adult residents representing a cross-section of the community (male, female, elders, youth over 18 years) or particular groups of interest (e.g. religious groups, local associations, vulnerable households). Individuals from these groups were selected because they were deemed to be well placed to provide the required information on the settlement. We also conducted interviews with 10 community residents and 5 public officials. The former were randomly selected from community leaders, health workers, politicians, Ebola survivors, traditional healers, pharmacists, academics, religious leaders, youth groups and women's groups, while the latter included members from government ministries, the local police unit and schools, public health officials and the local tribal chief. Focus groups lasted between 60 and 90 min and were audio recorded and transcribed.

The Human Participants Review Sub-Committee of the Office of Research Ethics at York University, Toronto (Certificate #: e2018-346) as well as the National Research Ethics Board of Liberia (NREB-BSR-037–8) and Sierra Leone (ICF #11A) reviewed and approved our research protocols.

The focus group data were transcribed and subjected to coding and thematic analysis by research assistants in the Sierra Leone Urban Research Centre in Freetown and the Community-Based Initiative group in Monrovia. Our orientation in coding and thematic analysis involved both deductive and inductive approaches. First, it was guided by broader questions related to community members' experiences with the community-based strategy, which we used to deductively arrive at broad themes or categories, we subsequently looked within these larger themes to inductively identify emerging subthemes, we then selected out from those subthemes those pertaining to social infrastructure. We used these identified subthemes as evidence for the points we discuss in this paper. The transcription excerpts used in this article were translated from the original Kreyol English vernacular used in both locations to standard English. In line with the project's overall objective of characterizing the salient features that characterized the community-based response, the following themes emerged from the data: isolation and fear, behavioral changes, migration or mobility, restrictions and response, misinformation, community engagement, and safety measures. From these we have identified subthemes related to social capital, social infrastructure and the provision of care during the community-based outbreak response.

4. Results

The community-based initiative was adopted because conventional response efforts were failing to curb EVD spread. In what follows we discuss the problematic, flawed or inadequate aspects of the earlier stages of the response. As part of this discussion, we address the question of how the mobilization of social capital and social infrastructure enabled these problematic aspects of the response to be addressed through community-based response strategies.

4.1. Lack of awareness and denial of the EVD threat

One way in which social capital was mobilized to improve the response was for community leaders to draw on existing networks to raise awareness, provide advice, and educate others on how to change their behaviours in ways that would protect them from the EVD threat. These types of activities were referred to as "sensitization" initiatives and were aimed at changing the behaviours of reluctant community members unconvinced of the reality of the EVD threat. Public health information and risk communication information provided through an existing and trusted social network was more likely to be better received, thus leading to a greater inclination to take the recommended courses of action. In this connection, an individual from the Muslim congregation in West Point reflects on the accuracy of information, how information was conveyed differently, as well as the communication problems that arose during the early phase of the response when information was provided by government officials and later when it was provided by leaders within that faith community:

> West Point Resident 1: The awareness for us Muslims came a little bit late. We had a tough time because people were not really given proper information early on. The governments did not come early to talk to religious leaders and tribal groups to make sure that we had proper awareness and that we were doing things properly together. We did not receive the proper advice as Muslims. As a result, we were not abiding by the preventative measures and were still bathing the dead. As a result of the lack of knowledge among us Muslims in the mosque we were still jamming up [side-to-side] to pray. So, with the community-based initiative we were given that information within the various mosques and other places. When we were given the proper information we changed the way we did things. Even in the mosque people started practicing distancing when praying in the mosque.

The types of issues that community-based initiative workers dealt with in their sensitization efforts and the effectiveness of their interventions were expressed by two residents of Dwarzark:

> Dwarzark Resident 2: During the Ebola outbreak when people avoided the hospitals, we were employed as community health workers. We organized house to house campaigns and sensitization to enlighten people on the need to visit the hospitals. Some people were afraid to visit the hospitals, especially the pregnant women, but due to our advocacy, they started going for treatment.
> Dwarzark Resident 1: We decided to do house to house visits and sensitization, especially on hand washing with clean water and soap and general means of preventing the Ebola virus. The youths were highly involved in the sensitization of people.

Raising awareness through interaction with others in the community had proven for the most part to be effective, but raising awareness in and of itself may not necessarily lead to behavioural change unless both the message and the messenger are trusted first. For this reason, trustworthiness is one important form of social capital that needs to be considered and since trust is dependent on the context in which it is embedded, the social and political circumstances of the setting must also be taken into account. It is towards such considerations we now turn.

4.2. Community distrust

Distrust has been identified by researchers as an important factor that made effective outbreak response difficult (Vinck et al., 2019; Richards et al., 2019). Reasons for community distrust varied according to the local circumstances. In Sierra Leone, numerous political conditions may have influenced some people's perceptions of EVD risk. For instance, one conspiracy narrative held that the EVD threat was concocted so that the national census that was scheduled for December 2015 would be suspended. This would allegedly enable the ruling political party to rig an impending election in their favour by not recognizing eligible voters in opposition stronghold areas (Bah, 2017). Another conspiracy tale held that EVD was a disease manufactured in a world class haemorrhagic fever research facility in Kenema (the regional capital of eastern Sierra Leone close to the epidemic epicentre) and let loose on the population by local and international elites to garner funds from the international community for the purposes of self-enrichment (Amos, 2017). Claims and counter-claims about the reality of EVD led to a confusing situation during the earlier phases of the response. Consensus on the reality of EVD started to emerge however as national politicians began to engage more actively with local community leaders, Thus, one resident of Dwarzark observed that:

> Dwarzark Resident 3: Many people did not believe the government because as I said earlier, the messages from the governing party and the opposition were contrasting. While one will say the disease was real, the other will say it was a lie and was brought to kill people. It was only when Dr. Khan [the country's only specialist on haemorrhagic fever] died, that we started gaining awareness and believed that it was a reality, but initially there was a lot of political misinformation and contrasting messages. It was only when the government decided to work with the international partners and when the opposition party to fight the disease, that we started seeing headway. For instance, when Members of Parliament moved into their constituencies, community leaders started talking to their people and this improved their awareness and it was then that people started believing. So, I think it was that approach that helped government to succeed in fighting the disease because people believed; but left alone with the government, they were not going to succeed.

Amos (2017) notes that although many conspiracy theories may seem outlandish, the reasons for the underlying suspicions may not be so unreasonable. For instance, if one considers the broader historical context of Liberia, the response of West Point residents that we discussed above should not be so surprising. From the time of its founding, tensions have existed between the manumitted Americo-Liberian settlers and the local population. The legacy of this form of colonial settler domination is seen in more recent times in form of the estranged relationship between the Americo-Liberian ruling elite in Monrovia and those outside the capital whose needs have been politically and economically neglected (Howard, 2017). The long-standing hostilities between political elites and local populations in Liberia has given rise to a situation where community members tend to generally view with suspicion all state-sponsored attempts to intervene in local affairs (Abramowitz, 2017: 433). West Point was home to many from other parts of the country who came to the settlement for various reasons, including displacement by the civil wars, or for improved job opportunities in Monrovia so that they could support themselves and their relatives in more distant rural areas. The actions of the state during the enforced quarantine at West Point and the public reaction that resulted should be considered in light of the historically established core-hinterland relationship in which suspicion of government actions was always lurking in the background. Thus, one West Point resident remarked that:

> West Point Resident 1: Yeah, just like what my senior brother has just said, you see, we can't fight the government, but we did it because we were pushed against the wall and the only way the government would pay attention to us was for us to engage them in that kind of way (i.e. through protest). The government intentionally quarantined West Point without taking into account any of the concerns of the West Pointers.

Within this politically charged setting, government claims about the

threat of EVD and other claims were met with suspicion. This made the possibility for cooperation between residents and official government and NGO responders even more challenging. Despite these challenges, the holding of town hall meetings and the subsequent recruitment of community leaders and members did allay feelings of distrust and allowed the the community-based initiative to gain momentum. This was accomplished by addressing various aspects of distrust. For example, trust concerning EVD information was more likely to be forthcoming if it was delivered by community members:

> West Point Resident 6: Yes, the trust came about because of information. Later, when I became an active case-finder through CBI t, I was able to convey information from the ETU (Ebola Treatment Unit) to the families and relatives of those in the ETU. It was through the sharing of information with the affected families that brought that trust. Affected families started to trust us as active case-finders because we were right there in the community. We were therefore able to build trust.
> West Point Resident 8: The CBI people came down to the people and they decentralized the issue of, you know, giving the information out, information dissemination, going from door to door, house to house. But unlike the government who were only raising awareness through the radio, and some of them [i.e. government officials] who were in the community, they were not working with residents of the community to the fullest. It was people from CBI who started to work with the residents of the community, started to work with the community directly. That approach toward the Ebola crises was different from that of the government.

The lack of awareness of the EVD threat and community mistrust were prominent challenges that were faced during the earlier period of the epidemic response. Both of these challenges were more subjective in nature and required changes in mindset. Tragically, such a change in this type of denialism of the EVD threat was triggered through the first-hand witnessing of an increasing death toll within the community (Ali, Well and Rose, 2021:6–7). Once the urgent need to adopt a different orientation was accepted under the tragic circumstances faced, the way was paved for the community-based response to address challenges that were more practical in nature, such as the provision of supplies and information for those quarantined and community monitoring and surveillance. We now turn to a discussion of these types of challenges.

4.3. Provision of basic supplies and information

The activation of the social infrastructure was crucial in the context of providing supplies for those quarantined. Faith communities played an integral role in this. For instance, several residents of the Muslim community in West Point remarked on how the social infrastructure of care in this regard was developed:

> West Point Resident 1: Our Muslim Jamaat [Congregation] also used to contribute to members of the mosque who were sick or quarantined. We contributed, met as a Jamaat and decided the items to buy. In some cases, we sent people to the quarantine homes to see which items they needed. And we ensured that the items were bought and distributed to them. We never gave them money because they were not allowed to move out and buy things; we just bought food and other items they needed. We also in some cases ensured that we fetched them water for cooking and other purposes.
> West Point Resident 2: We were service providers in the community and used to supply soap. With this we also did drama performances. When we wanted to supply the soap, we needed many people to come so we performed a drama with the support of [an NGO]. When the people gathered, we sensitized them on how to do the hand washing and when the required number of people were around, we then started the distribution of the Ebola prevention materials we had.

Another important service provided by community members was to transmit personal messages and messages about health status between those quarantined and their relatives:

> Dwarzark Resident 3: I was also engaged in providing information, especially to some of our friends who grew up in the community but presently reside overseas. They used to frequently call for updates on the Ebola outbreak in Dwarzark community in terms of who had died, which compounds were quarantined, which families were affected etc. We therefore served as their center for information as they will also call to confirm information they heard from other sources.

4.4. Social sanctions to ensure adherence to public health protocols

One of the noteworthy features of social capital is the role that formal and informal rules or institutions play in collective action (Ostrom, 2007). Informal sanctions are a normal feature of everyday life but take on even greater significance during emergency situations, such as an outbreak. This is because stricter regulation of behaviour is required to ensure that disease spread is halted. For example, wearing Personal Protective Equipment (PPE) properly is obviously very important in breaking the chain of transmission. As such, anything that can be done to ensure strict adherence to PPE protocols, including the use of informal sanctions is crucial. This is illustrated below:

> West Point Resident 10: When patients started to come into the holding center, our terrible experiences with the first Ebola cases and the subsequent deaths made us to demand everyone working with us to wear PPE. So, when any one of us made a mistake and forgot to wear PPE in the hospital, everybody would start reminding you. We were almost like reminding each other for everything. “Don’t forget your PPE oh” was our constant reminder to each other. It did not matter that the patient’s illness was Ebola or non-Ebola related, we will tell our friend “wear your PPE”. We would just pass by our friends and just warn our friends. And that’s what saved all of us in here, I think only one of our doctors died from Ebola in the hospital here.

The quote above points to the importance of informal social sanctions in changing behaviours. Not wearing PPE evoked a gentle verbal sanction from others. Although the social infrastructure is commonly defined in terms of its informal character, it does have certain formal features associated with it. For example, the social infrastructure may have also incorporated a more formalized hierarchy of authority within the community where more formal sanctions may be issued. Examples of this may be seen with respect to the introduction and enforcement of community by-laws pertaining to surveillance and quarantine, another important public health measure aimed at breaking the train of transmission:

> Dwarzark Resident1: There was a law that whoever comes into the community should report him/herself to the chief, and whoever tried to keep a stranger without reporting that person to the chief was to pay a fine of five hundred thousand Leone. We never allowed strangers to just come into the community. This was to prevent people who may have contracted the disease in other communities from coming to Dwarzark. We only allowed those that were part of the response team in fighting the Ebola.
> Dwarzark Resident 5: As community members, we also assisted some of the NGOs in distributing the items they brought as well as being

vigilant in monitoring people in houses that were quarantined. We served as watch dogs to ensure that people in quarantine homes did not leave those places and whenever we noticed such, we either reported them to authorities or encouraged them to return to their homes. We showed this vigilance because we were also afraid that the disease could easily be spread by people in quarantined homes and that really happened here.

One pertinent point regarding the use of social sanctioning is that although on one level it may work to break the chain of transmission, it may also have negative effects on other aspects of life, such as community fragmentation. Portes (1998) notes that negative social capital arises in situations were closely knit groups use their solidarity to exclude others or pressure members towards conformity. In this light, the imposition of community-based surveillance may also lead to similar negative effects, possibly leading to marginalization, resentment and suspicion - as expressed in the following participants' remarks:

Dwarzark Respondent 1: During the Ebola outbreak, there was so much malice and disputes among people, especially those who revealed where sick neighbors were hiding. Most of the houses in Dwarzark are not fenced so one could see a neighbor vomiting in the neighboring compound and when such cases are reported, this created disputes in the community. Those who reported these cases were seen as bad people because others never wanted their houses to be quarantined. Such malice therefore still exists in the community. They accused people of wanting them dead for reporting the issue to the response team. Many people in Dwarzark do not even talk to each other presently.

Similarly, analysis also revealed that community fragmentation may occur because of the perception by some that others used their position in the informal hierarchy for selfish pursuits, such as exclusively procuring community-based response jobs for relatives and friends. The emergence of such enduring feelings of ill-will in the community was a negative aspect of the community-based response that has not currently received much attention, but it is an important issue that should be addressed in future research on epidemic planning.

5. Discussion

5.1. Mobilizing social capital to address the limitations of the EVD response

The lack of awareness and denial of the EVD threat coupled with community distrust in government and NGO responders resulted in some ostensibly insurmountable problems in the conventional command and control response strategy. Issues pertaining to noncompliance with formal response recommendations and unsafe burial practices were particularly vexing. Dissent or community resistance were common explanations proffered to account for the documented refusal of people to visit hospitals, ETUs, and in the case of Liberia, to submit to mandatory cremation policies (Abramowitz, et al., 2015). One significant failing during the early response phase was that, although more than half of those admitted to the ETUs died, family members were not informed of their deaths (Pellecchia et al., 2015) and the bodies were buried or cremated anonymously. This led to widespread concerns and rumours that patients were deliberately infected with EVD so that their body parts could be harvested and that foreign NGOs were trying to keep this practice a secret (Bah, 2017). Consequently, community members: concealed those suspected of having EVD, refused to allow family members to be registered on follow-up contact lists, and banned intervention teams from entering villages (Le Marcis et al., 2019). Complaints about ETUs also centred on the lack of provision for family members to remain in contact with patients, as patient visits were prohibited (Richards et al., 2019).

How burials were conducted by official responders was criticized by community members. Deceased individuals exhibit a higher viral load increasing the EVD transmission risk associated with certain burial practices, such as the religious ritual of washing the body by family members within the Muslim community and the practice of embracing or kissing the deceased as a farewell gesture within the Christian and other faith-based communities. The WHO estimated that during the early stages of the EVD epidemic that 80% of all cases were linked to such practices (WHO Ebola Response Team, 2014). During the early response, burials were taken over by official burial teams who used mass graves and did not follow the religious or traditional precepts. Family members were not allowed to view the body or attend the burial. Further, family members criticized how the bodies were disrespectfully treated. This made community members reluctant to call the officials and to carry out the burials secretly in line with their traditions.

Both ETUs and burial practices were transformed through the active co-involvement of community leaders and members with official responders. Recruited community members became trained as liaison workers for the ETU (Abramowitz, et al., 2017). Their job was to link the facility with the community and to help in the implementation of quarantine. The latter included connecting families with those informal social networks that emerged to provide basic supplies and information for those in quarantine (as discussed above). Such individuals also served as crucial intermediaries between the community and NGOs involved in the response. For example, trained community members served as liaisons between an NGO in charge of opening an ETU in a sports stadium in Monrovia and the larger community by ensuring that community needs were first met by the ETU before the unit became operational (Le Marcis et al. 2019). On the basis of community involvement, ETUs were remodeled in both Sierra Leone and Liberia to become care centres that provided a wider range of services, including palliative care, free meals (taken as evidence of goodwill) and after-care reintegration packages for survivors (Richards, 2016:83), as well as providing mobile phones to patients so that they could remain in touch with family (Richards et al., 2019). The original construction of some ETUs involved high, opaque walls and even barbed wire which made them appear quite inhospitable. With the redesign of ETUs, these walls and wire were removed to minimize fear and quell rumours about what was happening inside (Richards, 2016:133). Further, family members were permitted to talk to patients across a fence or enter the ward garbed in personal protective equipment. Finally, based on active consultation, community members insisted that only those that are socially or familially related to the deceased could show proper respect to the deceased. amd based on their insistence, this led to policies for "safe and dignified" burial practices in both countries. Family members and official burial teams would then work side-by-side in preparing the body and conducting the burial in a manner that family members could be present at clearly marked grave sites (WHO Ebola Response Team, 2014).

5.2. Building ties between EVD responders and community members

Richards et al. (2019) note that in West Africa, public trust in biomedicine was elusive because of the abandonment of the health system that resulted from the imposition of structural adjustment policies. In order to finance their debts, West African nations in accordance with the requirements of structural adjustment polices were forced to reduce the funding of public services, including public health, turning health into a privatized commodity and ultimately leading to the

collapse of public health in these countries (Azetsop, Lado, Fosso, 2020:11). As a consequence: "the growth of private health institutions and the decline of public health institutions' performance, the urban poor and the rural population were condemned to access second-level and informal healthcare services" (ibid:11).[2] Further, within the historical context of the legacy of colonialism, foreign companies were forming alliances with state elites to ensure private gain based on corrupt practices with very little benefit going to the population. Within such a context, there were indeed valid socioeconomic and historic reasons for peoples' distrust of the health interventions introduced in West Africa (Leach, 2015).

It was against this backdrop that Richards et al. (2019) assert that during the EVD crisis, it was too late to lay the foundation for such trust. That is, negotiations had to be pursued in adopting a community-based response that included lay individuals in public health activities, that is, in activites that are commonly seen to fall within the exclusive preserve of government and NGO officials. During the early response phase, international responders were wary of any suggestion of 'home care' in the form of community-based quarantine and home-based health, fearing that this would facilitate EVD spread (Richards, 2016:136). On this basis, one senior international EVD responder argued that 'home care' was simply unethical. On the other hand, community members, particularly women, expressed the preference to care for sick family members on their own instead of sending them immediately to ETUs (Richards, 2016:136). Faced with dramatic failures in official-led health surveillance systems, disproportionately high mortality rates, the shut down of clinics and hospitals throughout the countries, and the construction of ETUs that could not keep pace with the demand, a critical impasse was reached, and it was recognized that alternative response strategies were urgently required (Abramowitz, et al., 2015).

As mentioned above, communities had already begun to take matters into their own hands with the establishment of community task forces led by local leaders. At that point, government and NGO response officials reached out to those leaders to pursue collaborative efforts based on community-based initiatives. Local leaders were key to the early adoption of such initiatives because as we have discussed, they served as the crucial intermediary in building relations of trust between communities and the state. In the language of the social capital perspective, these local leaders represented forms of "linking social capital" that serve to connect people of different social hierarchies, such as: employer/employee, landlord/tenant, or in this case, official responders and community members. Compared to other types of ties, linking social capital is less likely to provide new impulses or lasting solutions (Aßheuer, Thiele-Eich and Braun, 2013). However, as those same communities have been facing the current COVID-19 pandemic, there have been signs that the community-based initiative adopted during the EVD epidemic did establish a lasting foundation for future outbreak situations. For instance, we see in the case of Monrovia: the rapid mobilization of community volunteer teams who go around and educate people about COVID-19; the emergence of well-organized teams that keep track of the residential household compositions of all homes in the community block; the establishment of hand-washing stations maintained by youth groups at the entrance of informal settlements; reconvening of the teams that tracked the bodies of the deceased during EVD now becoming involved in compiling detailed reports on COVID-19; groups formed to ensure that proper masking was done, and arrangements made for community members to work with local tailors to produce mask for those who could not afford them (personal observations – Fallah).

[2] When Ebola struck, Sierra Leone only had about 13,000 community health workers – two health workers for every 10,000 people – with two-thirds of these lacking training in modern Western medicine (Lahai, 2017:18). A similarly dire situation was experienced in Liberia where the scarcity of health care workers meant that the nation of 4.3 million people was served by just 51 physicians (Boozary, et al., 2014).

5.3. Implications for epidemic planning

Classic outbreak response includes those activities pertaining to logistics, surveillance, case management and social mobilization (Ross, 2017). From our study, we see that the mobilization of social capital and social infrastructure through community-based interventions during the EVD response informed many aspects of these response functions. Perhaps, the most obvious examples of these pertain to the logistical dimension, such as the community-based provision of supplies and information (Section 4.3), as well as those instances dealing with social mobilization, such as dealing with the lack of EVD awareness (Section 4.1) and community distrust (Section 4.2). The theme of Social Sanctions to Ensure Adherence to Public Health Protocols discussed in Section 4.4 is associated with what is often thought of as the more technical aspects of the response, namely surveillance and case management. As discussed, the introduction of social sanctions was intended to ensure adherence to public health directives vis-à-vis abiding by the quarantine directives and disclosing possible EVD cases to officials. Surveillance and case management involves identifying, monitoring and maintaining a running tabulation of active cases and their contacts. As mentioned, difficulties arose in identifying active cases by official NGO and government responders because family members would sometimes not disclose possible cases. This occurred for various reasons, including the possibility that their loved ones would be taken away from them and left to die alone in ETUs or that they would be prohibited from carrying out the required funeral rites in accordance with their cultural and religious beliefs (Wilkinson and Leach, 2014:146). To address issues related to the reluctance to disclose, trusted members of the community were recruited to be involved in surveillance and case management. As discussed in Section 4.4 however, with this type of social mobilization there also arose certain negative consequences, such as community fragmentation. Thus, as alluded to previously, one implication of our findings is that it suggests an important avenue for future research in the development of community-based epidemic plans, namely greater investigation into the negative effects of social capital and social infrastructure mobilization during epidemics. In this light, future investigation into mobilizing the social infrastructure should also entail a consideration of the role played by existent potential ethnic and religious dimensions in contributing to divides within the community.

Secondly, our study sheds light on a key research focus that planning scholars (Berke and Lyles, 2013; Burby, 2006; May 1991) have identified as requiring further investigation, namely the dilemmas that may arise in balancing technical recommendations with social and political viability. Spencer et al. (2021) note the importance of the need to focus on such issues in pandemic planning more generally, and we agree, but add that this is especially and specifically salient when considering approaches more squarely based on the mobilization of social capital and social infrastructure of the type discussed in this paper. As we have seen, the imposition of purely Western-based technically defined medical protocols during the early stages of the epidemic response were met with community resistance. Indeed, such community resistance may have contributed to the observation made by Ross (2017) that the early international efforts in the EVD response were haphazard and ineffective. In this light, we contend that the lack of success was in part the result of the pursuit of epidemic response protocols that were not socially and politically viable within the context they were to be embedded. Specifically, a setting where there was widespread public denial of the EVD threat based on historical and political factors (i.e. that the threat was devised as a way for foreign funds to line the pockets of corrupt elites); and a pervasive sense of suspicion and distrust of foreign officials in a post-colonial context – especially in light of the manner in which ETUs were previously operated and the lack of attention and sensitivity to following burial rites acceptable by the community. As we outlined, in order to address such issues, a community-based protocol was developed

by, first, listening to community concerns; secondly, the recruitment of trusted formal and informal local leaders for developing feasible solutions; and, finally, the empowerment and training of community members in certain technical aspects of the response, such as those related to surveillance and monitoring. In both the Sierra Leone and Liberian cases, the impetus for community-involvement came from trusted government leaders who allowed the community to recruit their own local leaders and take ownership of the localized response within a particular community or neighbourhood. Such a strategy is of course not without its difficulties in terms of identifying those who are deemed trustworthy within a particular socio-political context, but in a decentralized strategy (such as the community-based response discussed in this paper) there are some clues as to how to identify viable community groups and leaders within existing networks of social capital and social infrastructure. We now turn to such considerations as part of a larger discussion of "hybrid governance" in disaster management.

Clark-Ginsberg et al. (2020) refer to situations where state and non-state actors jointly provide key services as "hybrid governance". They further contend that hybridity is not exceptional but rather common within local disaster management settings, especially in developing countries where the state may be weak and thus unable or unwilling to provide essential services. In these circumstances, it is religious and traditional leaders, local power brokers and other non-state actors who are the crucial actors typically engaged in everyday risk management but mobilized during times of emergency. Despite the contribution of such types of non-state actors, disaster risk reduction policies tend still to be premised on the assumption of a working state with scant attention paid to how these actors actually address risk in the field (ibid). This leads to a situation where risk management policies and initiatives tend to focus on strengthening the state rather than non-state practices, such as those informal practices embedded within the lives of those in informal settlements. The goal therefore according to Maskrey (2011) is to empower communities by changing their roles from objects to subjects engaged in the process or vulnerability reduction. Part of this strategy would be to enable community members to negotiate resources and support from local and central government to undertake risk management measures at all scales.

Hybrid governance of the type we have discussed in relation to the mobilization of social infrastructure occurs in a context where so-called natural disasters must be understood as the temporary accentuation of a daily natural hazard – a condition described as chronic risk by Sen (2000). With this awareness, as Maskrey (2011) points out, most communities were already doing what they could do to manage such risks with the limited resources at their disposal. With reference to many parts of Africa, infectious disease may in fact be understood as a chronic risk because many inhabitants already have experiences with endemic and epidemic disease (for example, tuberculosis, Lassa fever, malaria, and more) and have more pressing issues such as caring for children sick with those ailments. Indeed, such lived experience may be another reason why local community members may not feel the same level of fear or urgency as international health care workers might expect (Hewlett and Hewlett, 2008:143). The symptoms of EVD were akin to the daily health experiences many people had in the past with flu or malaria while the amount of attention that Western responders to what they saw as a similar disease served as evidence of a hidden agenda, which affirmed misinformation about the disease (Leach, 2020). Furthermore, the injection of resources for EVD could not immediately address long-term issues, while the narrow focus adopted undermined still further the availability and use of health services for other health conditions such as malaria and maternal health (ibid). Awareness of such local circumstances, perceptions and experiences may help to inform pandemic plans in ways that lead to greater compatibility in particular settings.

The raised awareness of the local conditions of lived existence will also facilitate the process of identifying trusted local leaders. In the case of Liberia, for instance, a series of town hall style meetings with different groups in the area was organized by one of the authors (Fallah - who was an official in the country's Ministry of Health and responsible disease surveillance in Monrovia at the time). The purpose of the meetings was to identify trusted formal and informal community leaders supported by the community-members themselves and then to subsequently train these leaders in the community-based outbreak response initiative. Through this approach, official responders were able to identify and mobilize the necessary social capital networks and social infrastructure. Such an approach also facilitated access to the resources and know-how of the community – aspects of pandemic planning that a top-down approach tends to neglect. It is through such a mechanism that responders can access those assets that state actors may not be aware of because the mechanism that permit dialogue with local, particularly the poor; communities, do not exist in most top-down risk reduction strategies (Maskrey, 2011). It should be kept in mind, however, that the key to success of the social infrastructure mobilization strategy was the collaborative nature of the relationship between state and non-state actors in all aspects of the outbreak response. As such, our findings and argumentation should not be taken to support or justify the investment in social infrastructure as a substitute of urgently needed long-term state investments in public health infrastructure, housing and physical infrastructure. Rather, it should be recognized that the emergence of the social infrastructure in informal communities was a coping strategy borne of necessity because of the absence of a state that could be mobilized quickly during an emergency situation. The unintended consequence of state neglect was ironically a robust community response system that should not be exploited either in a short or long-term basis, but should work in conjunction with the state in a collaborative and equitable manner for the furtherance of the collective good on a more enduring basis.

6. Conclusion

This paper posits that formalized conventional approaches based on a command-and-control orientation toward outbreak response, as deployed at the onset of the EVD outbreak in Sierra Leone and Liberia, exacerbated community distrust in government and NGO responders. This led to some ostensibly intractable problems pertaining to hostility and noncompliance with formal response recommendations. Throughout the paper, we have argued that despite the high levels of deprivations and the typically wide range of threats (eviction, health, disaster risks) faced, residents of informal settlements wield strong community networks which epidemic planning and response can benefit from. However, outbreak response is often perceived to require immediate response that can only be met through conventional strategies. This may be misguided because conventional approaches may not allow the rapid mobilization of the social capital needed to ensure successful outcomes, whereas community-based approaches may prove to be better in that regard – as demonstrated in our study.

We have also argued that in settings such as Sierra Leone and Liberia where public health infrastructure and health care systems were severely disrupted by civil wars and, which still suffer from chronic underfunding, the social infrastructure and local family-based strategies which people have historically relied upon to cope with their everyday challenges (including the meeting of health care needs), should be leveraged upon to make health epidemic responses more effective. In particular, we have shown that mobilizing existing networks of social capital in epidemic response is important especially during moments when support from government and other sources is either less certain, or when official response approaches are not proving to be sufficiently effective. In this light, a central element of a more effective response would be to build on the networks, kinship, families and the trusted relationships that community members have built over time and that have been observed in urban communities of the Southern hemisphere around the world during the COVID-19 pandemic (Bhan et al., 2020). These forms of social capital allowed local community residents to

demonstrate high levels of agency during the EVD outbreak. Their local initiatives were vital in not only protecting themselves and other community members from the spread of the disease but also, in providing care for other community members in life-threatening conditions or in quarantined homes. We consider these as important lessons to draw from for any future epidemiological response.

CRediT authorship contribution statement

S. Harris Ali: Conceptualization, Formal analysis, Writing – original draft, Writing - review & editing, Supervision, Funding acquisition. **Mosoka Fallah:** Formal analysis, Writing – original draft, Methodology, Investigation, Data curation, Writing - review & editing, Project administration, Funding acquisition. **Joseph McCarthy:** Formal analysis, Writing – original draft, Methodology, Investigation, Data curation, Writing - review & editing, Project administration, Funding acquisition. **Roger Keil:** Formal analysis, Writing – original draft, Writing - review & editing. **Creighton Connolly:** Formal analysis, Writing – original draft, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We gratefully acknowledge the work of members of the Sierra Leone Urban Research Centre (SLURC) and the Community-Based Intitiative-Liberia in this project. We are also grateful to the many members of the communities in both Freetown and Monrovia who gave generously of their time to be interviewed and participate in focus groups.

Funding

This research was funded by the International Development Research Centre (IDRC) of Canada, grant number 108967-001.

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