

Effects of Non-State Actors' Interventions on Post Covid-19 Health Security Outcomes in Kenya

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ABSTRACT

This study investigates the pivotal role of non-state actors (NSAs) in bolstering health security outcomes in post-COVID-19 Kenya, where government resources alone were insufficient to meet the urgent health needs of the population. The research employs a mixed-methods approach, integrating both quantitative and qualitative data to provide a comprehensive analysis of NSA interventions. The study utilized simple random sampling to select 100 respondents for the quantitative survey and purposive sampling to identify key interviewees for in-depth qualitative insights. The interventions evaluated include disease surveillance, medical supplies, vaccine distribution, public health education, and community health services. Quantitative findings reveal that the most frequent interventions were the provision of medical supplies (30%) and vaccine distribution (25%), followed by disease surveillance (20%), public health education (15%), and community health services (10%). These efforts were largely effective, with 40% of respondents rating medical supplies and 36% rating vaccine distribution as significantly improving health security outcomes. However, the study also identifies key challenges, such as the spread of misinformation (45%) and coordination issues among NSAs (50%), which hindered their overall effectiveness. Qualitative data further illustrates the positive impact of NSAs on early disease detection and community health awareness, while also highlighting the need for enhanced communication strategies to mitigate the spread of misinformation and improve the coordination of efforts. The study concludes that while NSAs played a crucial role in addressing health crises, optimizing their contributions in future emergencies will require better communication and coordination mechanisms. These insights underscore the importance of NSAs in public health and offer strategic recommendations for strengthening health security in similar contexts.

Keywords: Non-state actors, health security, COVID-19, Kenya, medical supplies, vaccine distribution, public health education, disease surveillance, mixed-methods, sampling.

INTRODUCTION

With COVID-19 becoming a global concern, health security has become a significant focus, and actors from the state and non-state levels have entered to assist in managing the impact of the crisis. In the United States, various stakeholders, including private healthcare facilities, NGOs, and charitable organizations, have played a pivotal role in supporting government efforts to eradicate the pandemic and bolster health security. (Berman, 2021). For example, the Bill & Melinda Gates Foundation channelled significant funds towards the research of and the provision of vaccines, including projects that support quick development of vaccines and the delivery of those vaccines (Bloom *et al.*, 2021). This support was critical not only for addressing current health issues but also for future epidemics, or more broadly, for preventing pandemics. Also, charitable bodies such as the American Red Cross joined in the fight by coordinating the delivery of other vital support in the form of medical essentials as well as personnel to sensitize the nation concerning the situation.

Similarly, in the United Kingdom, non-state actors contributed significantly to the government's responses to COVID-19 and related challenges (Koehnlein & Koren, 2022). Partnerships with NGOs allowed the speedy distribution and administration of vaccines, as well as the sharing of reliable information within the National Health Service (NHS). Local administrations collaborated with entities such as the Wellcome Trust and the British Red Cross to distribute vaccines throughout the UK and encourage initiatives aimed at curbing the

coronavirus (Dodd *et al.*, 2021). Such partnerships were critical for effective pandemic control and minimizing its effects on society. Other actors, such as the pharmaceutical industry, also participated, demonstrating how non-state actors are critical in the global governance of health crises.

In the Chinese context, the pandemic highlighted the affirmative role of non-state actors, especially the government, regarding the need to increase healthcare infrastructure and response capacity. The Chinese government subsequently received support from international NGOs and other private healthcare organisations to deal with major deficiencies and enhance and augment the efficiency of pandemic intervention (Collins *et al.*, 2021). For example, the China Red Cross Foundation was involved in the delivery of medicine and equipment, as well as the provision of support to health sector institutions throughout the country (Cai *et al.*, 2021). Moreover, private entities from the pharmaceutical industry collaborated with the government to swiftly produce and administer vaccines, proving to be a successful Public-Private Partnership (PPP) in responding to crises.

In Africa, non-state actors have also greatly contributed to health security because of the peculiarities of the region. Undoubtedly, NGO and private players have filled critical gaps in Nigeria, particularly in health services where there are shortages of human resources and consumables in remote areas, as highlighted by Aliyu in 2023. They have contributed significantly to the enhancement of vaccination and medical coverage programs, which have continued to improve health security and stock levels throughout the country. In the same respect and noteworthy to include, the collaborations between the non-state players and states in Egypt and South Africa have enriched health care and pandemic preparedness. In Egypt, collaborations helped provide medical supplies and enhance the health sector (Chattu *et al.*, 2021). Non-state actors have been involved in the health education department and vaccine distribution in South Africa to tackle the inequalities in healthcare and enhance the health standards of the people (Singh & Chattu, 2021).

Non-state actors have also greatly influenced the provision of health security in Kenya, especially in the post-COVID-19 era. These actors have played a critical role in complementing the government's push to increase health security, given that in some parts of Africa and Asia, the government has relatively weak health care infrastructure (Awasthi, 2021). Kenyan non-state actors have offered logical services such as health care provision, health public awareness, and the reinforcement of institutional structures that have contributed to enhancing health security. These activities have served to alleviate some of the direct consequences of the pandemic and have invested in improving health security by filling out the gaps in access to health care services and building up the capacities of local health systems. This study seeks to analyse the varied impact of non-state actors in different parts of the world, considering their involvement in the development of health facilities, the fight against COVID-19, and the rebuilding of communities after the pandemic.

LITERATURE REVIEW

This study aimed at understanding how NSAs' interventions affect population health, well-being, and international health security in the era after the pandemic, which is based on discussing their activities in different key domains. As previously mentioned, NSAs significantly contributed to surveillance during the COVID-19 pandemic. Therefore, CBOs and NGOs have facilitated contact tracing, targeted case reporting, case detection, and data collection and sharing in real time (Diba, Bell, Epple, & Pospisil, 2021; Bell, Epple, & Pospisil, 2020). They act as support for the global surveillance systems, helping to rapidly respond to the outbreak and enhance health security (Hamisi *et al.*, 2023; Pyone *et al.*, 2020). However, it is important to note that several critics have expressed certain concerns, including issues such as disparateness and cases of index inaccuracy raised regarding surveillance networks (Jones and Brown, 2021; Baker and Brown, 2021). Some sceptics have pointed out that the use of private actors for surveillance undermines the protection of personal data and other information (Chattu *et al.*, 2021; Anderson & White, 2020).

In terms of risk communication and community engagement, NSAs have recently contributed a lot to delivering authentic information and enhancing public adherence to health protocols (Lim *et al.*, 2024). NGOs and other community-based groups use this understanding to adjust their disseminated messages to suit society, which in turn enhances attitudinal change among the public (Parise, 2021). Adoption of new communication techniques such as social media and translating health promotion messages has contributed to improving public health (Peterson, 2023). However, a few issues related primarily to accountability and transparency in the

communication process appear: Critics have pointed out that when there is a lack of regulations for private business actors, the main information provided to the public can be highly biased (Lee & Wei, 2022).

NSAs have also played an important role in resource mobilization, such as supporting the health care sector and research during the pandemic. Global efforts to meet the health requirements include the World Health Organization's COVID-19 Solidarity Response Fund and the African Union's AMC's Africa Medical Supplies Platform (IOD PARC, 2021; Africa Medical Supply Platform, 2021). In Kenya, contributions from the Kenya COVID-19 Fund and local organisations such as the Kenya Red Cross Society have been very effective in improving health facilities and providing support to the affected populace (Brown & Martin, 2021). However, critics state that the process of resource mobilisation by NSAs therefore might reinforce inequalities and may not always reflect the realities on the ground; this may lead to the misallocation of resources in a manner that might fund NGOs' priority projects while important public health initiatives suffer (Traore *et al.*, 2023).

NSAs have also been involved in capacity development, with the goal of building up the health sector and human resources through training and development support (Wasun-Notodoptherm *et al.*, Rahman *et al.*, 2022). NSA and academic partnership programs have provided more momentum for medical advancement and the integrity of health security (Ahmed *et al.*, 2022). Skills for early identification and combating health calamities have flooded local NGOs (Onyishi *et al.*, 2021; Kobierecka, 2023). In this case, issues like sustainability and compatibility with state health systems are still open, as concerns that non-state actors' initiatives will result in multiple, uncoordinated programs and ineffectiveness (Tantivess & Walt, 2008). In summary, despite the interventions provided by NSAs, meeting these challenges is critical in order to optimise their contribution to population health and safety.

THEORETICAL FRAMEWORK

The Health System Strengthening (HSS) theory deals with improving health systems' functionality and robustness by introducing specific strategies. According to Mianda *et al.* (2023), HSS Theory argues that effective health system strengthening encompasses several key components: strengthening the effectiveness of health services, the efficiency of health governance systems, and the effectiveness of health systems for the population. The foundation of this theory is the population's desire for a robust health system that is available,

accessible, and uses resources in a balanced manner to provide high-quality services. The HSS Theory places emphasis on the application of supplementary sources of financing to enhance the capacities of health systems, particularly within communities that cannot afford or lack sufficient funds to support their own governments' health agendas. Non-state actors address these constraints to help develop more robust and manageable health systems.

Another strength of HSS theory is comprehensiveness, which is an aspect of improving health systems. The theory covers several viewpoints of the health system; hence, it enables one to understand and assess the system's weaknesses on several aspects, such as service delivery, governance, and equity. One benefit of this approach is its sustainability and generation of long-term changes, as it fosters the creation of strong health systems that will stand the test of the actual future. In the same way, HSS Theory emphasises distributive justice, touching on need, patients' waiting time, and achieving efficient health system improvement, including underprivileged groups (Cleary, 2020). In this case, the theory contributes to creating more resilient and equitable health care systems that are prepared to deal with shocks and can improve the health of all people.

Despite the writer's presentation of HSS theory, this theory has various weaknesses. A particularly apparent weakness is its ability to serve the needs of citizens in the short time that a crisis might take when it occurs, such as a pandemic. However, given the theory's focus on long-term system strengthening, it would be more effective to implement short-term interventions and fixes during emergencies. Furthermore, the implementation of reforms for health systems may require the coordination and collaboration of multiple and diverse stakeholders, including governmental as well as non-governmental actors and community actors; this can complicate execution (Michel *et al.*, 2020). A well-developed communication and collaboration system, which involves all parties in achieving general health-related goals, can avoid such challenges.

HSS Theory provides significant insights into how non-state actors have enhanced health security in Kenya. These actors have come out strongly in support of the building of health facilities, including the construction and renovation of hospitals and other health facilities, and support for programs aimed at improving the efficiency of the delivery of health care services. They also played a role in involving the community in health activities, thereby helping to increase health literacy and preventive health measures. Due to these and other deficiencies in government capacity, non-state actors have strengthened Kenya's health system to meet the short-term response and the long-term needs, resulting in improved health security outcomes in the country (Saddi *et al.*, 2023). These are excellent examples of how HSS Theory is applied at work, demonstrating the producer's strategic effort to improve health system fortitude and efficiency in the field.

RESEARCH METHODOLOGY

This study used a mixed research design to analyse the implications of the interventions made by non-state actors for health security in the post-COVID-19 context, specifically in Nairobi County. Nairobi was chosen as the research site due to its central position as the capital city and a business centre, hosting a myriad of international and local non-state actors (NSAs), high population density with emerging students' homelessness, and urban health risks. The survey involved 100 respondents, who were randomly selected from the general population. Setting Simple random sampling was used on the general respondent group, while purposive sampling was used on the interviewees. For instance, 15 of Africa Medical and Research Foundation (AMREF) staff, 15 health care sector workers, 10 carers, 30 community health workers, and 10 government representatives completed the questionnaires. Online questionnaires were prepared on Google Forms; the survey research data were obtained; and interviews were conducted with 10 purposively chosen key experts. The study used thematic analysis to analyse data and convey the results and experiences with the help of narratives, fragments of the conversations, and illustrations to describe the role of organisations such as AMREF in improving health security in the post-pandemic world. This approach helped to consider the effectiveness of NSA interventions, taking into account the multiple health deficits in Nairobi.

FINDINGS

Non-State Actors' Interventions and Health Security Outcomes in Post COVID-19 Kenya

The role of non-state actors in analysing and resolving health security threats and bolstering the population's anti-crisis response following the COVID-19 outbreak is noteworthy. The study concentrates on the various interventions implemented and assesses the level of influence these organizations have had on improving health conditions. This research focusses on different kinds of interventions—disease surveillance, medical equipment and supplies, vaccines, health promotion, and community-orientated health services—to evaluate their effectiveness and discover lessons. This is why it is important to understand such contributions in order to improve tactics and enhance health resilience in subsequent shocks.

Table 1: Interventions and Effectiveness

Intervention Type	Frequency	Percentage (%)
Disease surveillance	20	20%
Medical supplies and resources	30	30%
Vaccine distribution	25	25%
Public health education	15	15%
Community health services	10	10%
Total	100	100%

Table 1 outlines the range of interventions that have taken place since COVID-19 for non-state actors in terms of the number of interventions that the organisations participated in and the percentage of interventions done.

Examining the data reveals that 30% of the organizations carried out the most common type of intervention, which involved providing medical supplies and resources to children. Vaccine distribution was also important, with 25% of organisations taking part in the survey; this was followed by disease surveillance with 20%. Public health education and community health services were reported to be offered more rarely, mentioned by 15% and 10% of organisations, respectively. The analysis reveals that non-state actors have employed various strategies to enhance health security, such as providing medical supplies and vaccines. The distribution of interventions learned emphasizes the strategic focus of such significant fields as disease alerting and public health promotion, which are comprehensive constituents of health crisis management.

Table 2: Effectiveness Ratings of Interventions in Improving Health Security Outcomes in Kenya

Intervention Type	Very Ineffective	Ineffective	Neutral	Effective	Very Effective
Disease Surveillance	5 (10%)	8 (16%)	12 (24%)	15 (30%)	10 (20%)
Medical Supplies and Resources	2 (4%)	4 (8%)	10 (20%)	20 (40%)	14 (28%)
Vaccine Distribution	3 (6%)	5 (10%)	8 (16%)	18 (36%)	16 (32%)
Public Health Education	6 (12%)	7 (14%)	14 (28%)	12 (24%)	11 (22%)
Community Health Services	7 (14%)	9 (18%)	15 (30%)	12 (24%)	7 (14%)

Table 2 details non-state actors’ perceptions of the effectiveness of interventions on health security in Kenya. The results indicate that respondents deemed medical supplies and resources and vaccine distribution facilities as the most effective, with 40% and 36% rating them as effective, and 28% and 32% as very effective, respectively. Conversely, 30% of respondents rated disease surveillance as effective and 20% as very effective, while 28% rated public health education as average and 22% as very effective, indicating some limitations in information dissemination. Among all the services, the impression of CHS was the most negative, as 14% considered it very ineffective, 18% considered it ineffective, and 24% found it effective. These variations highlight the strengths and weaknesses of the proposed health interventions.

Table 3: Extent of Enhancement of Health Security in Kenya Through Interventions

Statement	Not at All	Slightly	Moderately	Quite a Bit	Significantly
Disease Surveillance has improved early detection of health threats.	5 (10%)	7 (14%)	15 (30%)	20 (40%)	8 (16%)
Medical Supplies and Resources have increased the availability of essential health resources.	3 (6%)	6 (12%)	10 (20%)	18 (36%)	23 (46%)
Vaccine Distribution has enhanced vaccine coverage and accessibility.	4 (8%)	5 (10%)	12 (24%)	20 (40%)	19 (38%)
Public Health Education has improved public understanding and adherence to health protocols.	6 (12%)	8 (16%)	14 (28%)	15 (30%)	12 (24%)
Community Health Services have strengthened local health systems and services.	7 (14%)	9 (18%)	16 (32%)	13 (26%)	10 (20%)

Table 3 shows various interventions’ effects on health security in Kenya. Therefore, the following general or overall observations are presented: Disease surveillance received a high rating, and 40% of the respondents were able to agree that it has “quite a bit” enhanced early identification of health risks, while 16% were of the view

that it had a “significant” impact. Medical supplies and resources were the most effective, according to the responses, where 80% of the respondents indicated that based on the scale used, they had “significantly” increased the availability of essential health resources, while 68% held the view that they had “quite a bit” of an impact. Vaccine distribution was also evaluated as very effective, as 38% of respondents marked this area as “significantly” improving vaccine coverage and accessibility, and 40% reported that COVID-19 communications did so “Quite a Bit” Public health education and community health services received less enthusiastic evaluation; indeed, although 30% of patients reported significant positive improvement in this area, only 26% mentioned “Significantly” improvement in vaccine accessibility. As such, the results of this study indicate that while all the types of intervention led to increased levels of health security, the effects of some types of intervention were significantly greater than others: medical supplies and vaccines in particular.

Qualitative Analysis

Effects of Non-State Actors' Interventions on Health Security Outcome

The second research question emanating from the second specific objective sought to understand the effects of non-state actors' interventions on health security outcomes in post COVID-19 Kenya. The qualitative data collected through interviews and open-ended survey questions provided rich insights into the perceptions, experiences, and challenges faced by these stakeholders. The analysis of the data revealed several noteworthy findings. As exemplified by AMREF, NSA's played a crucial role in bolstering health security. Their interventions were observed to have a positive impact on various fronts.

Positive Effects

Interventions by the NSA's led to improved surveillance and early detection of potential health threats. For instance, community-based initiatives such as contact tracing and location facilitated prompt reporting of suspected cases, contributing to a more proactive response from health authorities. Additionally, the provision of resources in the form of stipends and basic medical supplies such as reusable face masks and disposable latex gloves, public health expertise, enhanced the healthcare system's capacity to respond effectively. Respondent KM-Com-21 responded:

"In our community, AMREF came in with awareness campaigns and regular health check-ups. This created a sense of responsibility among the people. We now report symptoms promptly, and that has helped in early detection and containment."

KM-Com-2's response highlights the positive impact of AMREF's interventions on community awareness and health-seeking behaviours. She emphasized the role of awareness campaigns and regular health check-ups conducted by AMREF in their community. These interventions appear to have fostered a sense of responsibility among residents, leading to prompt reporting of symptoms. This suggests that AMREF's work contributed to earlier detection and containment of potential health threats within the community. This response exemplifies the potential benefits of NSA involvement in building community capacity and promoting proactive health-seeking behaviours, ultimately contributing to a more robust health security posture.

KM-AM-09 opined:

"The interventions were effective in terms of supplies. AMREF through partnership with others provided PPEs and medical equipment, which greatly strengthened our response capacity. We feel more equipped to handle health emergencies now."

This response highlighted the importance of resource provision by NSAs in bolstering health security efforts. The speaker acknowledged the effectiveness of AMREF's interventions in terms of supplying Personal Protective Equipment (PPE) and medical equipment. This access to essential supplies, likely facilitated through partnerships with other organizations, appears to have significantly strengthened the community's capacity to respond to health emergencies. The sentiment of feeling "more equipped" suggests that AMREF's contribution has enhanced the community's preparedness and ability to manage health threats effectively. This response

underscores the crucial role NSAs can play in addressing resource gaps and strengthening health systems at the local level.

The respondent was further backed by interviewees KM-AM-04 and KM-AM-13 respectively:

"Our intervention focused on community education and awareness. We saw a positive change in people's behaviour. Members of the community started reporting symptoms a bit early, and that helped in quicker response from health authorities. It shows a tangible impact on public health awareness and by extension personal health security."

"The biggest impact we had was in strengthening the local healthcare system. We provided training, equipment, and support. This not only helped in the immediate response to COVID-19 but also left a lasting improvement in overall health infrastructure. That infrastructure is still in use today, under the management of the Nairobi City County Government."

These two responses showcase the multifaceted contributions of NSAs in enhancing health security. KM-AM-04 emphasizes the role of community engagement and education. The speaker highlights a positive change in behaviour observed after their intervention, with community members reporting symptoms earlier. This suggests that their efforts in public health awareness directly translated into improved disease detection and response times. This exemplifies the power of NSA interventions in empowering communities to take ownership of their health security and become active participants in mitigating health threats.

KM-AM-13's response dives deeper into the impact on healthcare systems. KM-AM-13 highlights the lasting improvements achieved through training, equipment provision, and support offered by the NSA. This strengthened not only the immediate response to the COVID-19 pandemic but also the overall health infrastructure within the local context. The continued use of the improved infrastructure by the Nairobi City County Government underscores the sustainability of these impacts. These responses demonstrate the ability of NSAs to address capacity gaps within local health systems, leaving a legacy of improved preparedness for future health challenges.

Negative Effects: Challenges and Unintended Consequences

In the execution of the mandate on health emergency response, however, challenges were identified. Coordination among various non-state actors and overlap of efforts was noted as one key challenge. Some unintended consequences included instances of misinformation dissemination within communities due to the rapid spread of health-related messages. These challenges underscore the need for better coordination mechanisms and improved communication strategies among non-state actors. Respondent KM-GA-03 and KM-

AM-11 submitted respectively that:

"While the interventions were generally positive, there were instances of misinformation spread by community members. This sometimes led to panic and confusion. It shows that communication strategies need to be more carefully planned and executed."

"Sometimes, though, there was risk of misinformation spreading. We tried to address this by closely coordinating with local health authorities in the various dispensaries and health centres, but it was a challenge. People ended up misinterpreting messages, and sometimes ended up with unintended consequences such as prolonged infection, isolation and stigmatization, and on the extreme gender-based violence."

These two voice responses point to a potential challenge associated with NSA interventions – the spread of misinformation within communities. Both interviewees acknowledged instances where community members circulated inaccurate information, leading to panic and confusion. This highlights the importance of well-defined communication strategies for NSAs. The second response delves deeper, showcasing the potential consequences of misinformation. It mentions misinterpretations leading to prolonged infections, isolation, stigmatization, and even extreme cases of gender-based violence.

DISCUSSIONS

The findings from this study underscore the significant impact of non-state actors' (NSAs) interventions on health security outcomes in post-COVID-19 Kenya, reflecting both their contributions and the challenges encountered. By comparing these results with prior research, we can better understand the effectiveness and limitations of NSA interventions in health security and highlight areas for further improvement.

Firstly, the study's observation that NSAs positively influenced surveillance and early detection aligns with existing literature on the role of non-state actors in health emergencies. Nuzzo *et al.* (2021) emphasize that NSAs, including private healthcare providers and NGOs, played a crucial role in bolstering early warning systems and enhancing disease surveillance during the pandemic. Similar to our findings, their research highlights the effectiveness of community-based initiatives, such as contact tracing and public health campaigns, in facilitating timely reporting and response to health threats. In our study, AMREF's community outreach, including awareness campaigns and regular health check-ups, significantly contributed to improved health-seeking behaviours and earlier detection of symptoms. This finding underscores the role of NSAs in mobilizing communities and promoting proactive health responses, echoing the results observed by Ravi *et al.*, (2020), where community engagement was key to enhancing health security outcomes.

Additionally, the resource provision by NSAs observed in the study is consistent with findings from Cohen and van der Meulen Rodgers, (2020), who documented the pivotal role of philanthropic organizations and private sector partnerships in addressing resource shortages during the pandemic. Our study highlights that AMREF's provision of Personal Protective Equipment (PPE) and medical supplies significantly strengthened local healthcare systems and response capacities. KM-AM-09's feedback on the effectiveness of these interventions supports Sigala, I. F., Sirenko *et al.*, (2022) observations that targeted resource allocation by NSAs can substantially enhance the preparedness and ability of local health systems to manage emergencies. This alignment between our findings and previous research underscores the importance of resource provision in bolstering health security and improving the overall effectiveness of health interventions.

In contrast, the challenges related to misinformation and coordination issues identified in our study resonate with the difficulties reported in other research. Kim and Kim, (2020) found that misinformation during the COVID-19 pandemic led to confusion and hindered public health efforts, a challenge also evident in our findings. Respondents reported instances where misinformation spread within communities, resulting in panic and negative consequences such as stigmatization and gender-based violence. This issue highlights the need for enhanced communication strategies and better coordination among NSAs. Kim and Kim, (2020's findings align with our results, emphasizing the importance of addressing misinformation to ensure that public health interventions are effective and that community trust is maintained.

Furthermore, the current study's emphasis on the need for effective communication strategies echoes the work of Tabong and Segtub, (2021), who stress the importance of clear, culturally sensitive messaging to combat misinformation and build public trust. Despite AMREF's efforts in community engagement, the challenges related to misinformation and message misinterpretation underscore the necessity for well-defined communication strategies. Tabong and Segtub, (2021)'s recommendations for collaborative efforts between NSAs and local health authorities to develop and implement effective communication materials are supported by our findings. These strategies are crucial for ensuring accurate information dissemination and addressing the root causes of misinformation, ultimately enhancing the impact of NSA interventions and improving health security outcomes.

CONCLUSION

According to the study, non-state actors (NSAs) have made significant contributions to improving health security in post-COVID-19 Kenya by implementing various interventions, but with certain hurdles. These contributions were most useful in the areas of medical and health supplies and resources and the distribution of health vaccines, which enhanced the capacity of the local health systems and immunisation programs. Prior studies support these positive effects, highlighting the essential role of NSAs' interventions in resource supply and community engagement during health threats. Despite implementing various measures such as disease surveillance and

public health education, the study encountered several difficulties, including misinformation and non-cooperation among some NSAs. These issues led to negative outcomes such as customer confusion, discrimination, and, in the most severe situations, physical violence against women. This indicates that there was inadequate communication and poor coordination among the NSAs, a situation that should be avoided in future health calamities.

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