

## Role of Community Health Workers in Early Detection, reporting and Response to Infectious Disease Outbreaks: Experience from Marburg Outbreak Management in Kagera region, Northwestern Tanzania

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### Abstract

**Background:** Community health workers (CHWs) are involved in different segments of health promotion and surveillance systems to control the outbreak that occurred in March 2023. CHW initially detected and reported deaths of unknown causes through an established community electronic event-based surveillance. Later, it was confirmed to be MVD; until the end of the outbreak, a total of nine people were confirmed with Marburg viruses, and six of them died, making a case fatality rate of 66.7%.

**Involvement of Community Health Workers in Response to Marburg Virus Disease:** CHWs from the high-risk areas were oriented to the disease and appropriate control measures. They were guided on the necessary precautions to ensure their safety while working and equipped with infection protection equipment. CHWs were in a frontline position to support the mobilization of community members, awareness creation, provision of public health education, and psychosocial support. Reached the community members by visiting households, public places, schools, and worship places. They received monetary remuneration to commit outstanding time to the outbreak control efforts.

**Conclusion:** The lesson learnt is that trained CHWs adequately equipped with working tools, protective equipment and remuneration can contribute substantially to outbreak detection and response initiatives. We advocate for their involvement in future outbreak preparedness and response because of their centric position in communities where traditional outbreaks start. Recommend adopting policy and practice strategies that promote their integration and recognition by health systems as a paid cadre to sustain and enhance their efficiency.

**Keywords:** Community health workers, Outbreak detection, Marburg Virus, Tanzania

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## Introduction

Participatory community-based approaches stem back to the 1978 Alma Ata declaration that identified community as central to the efficiency of primary health care services. Recently, there has been growing appreciation for the role of the community in implementing community-centred mitigations to achieve universal health coverage as part of Sustainable Development Goals. (Marston *et al.*, 2016). With the increased risk of occurrence of both infectious and non-infectious diseases in the settings characterised by optimal human-animal-environment interaction and health systems with limited capacity in pathogen detection, identification, and risk management, intersectoral, multisectoral and multidisciplinary approaches embracing community participation and engagement are key for efficiency and effectiveness of disease control and prevention programs. (George *et al.*, 2015).

Both the International Health Regulations 2005 (IHR) and Joint External Evaluation Tool (JEE) advocate for countries to have a skilled and competent workforce for maintaining sustainable public health surveillance and response mechanisms with emphasis on building sub-national level capacities. (Boyce and Katz, 2019). However, it has remained a challenge for most countries with limited resources and capacity to achieve this milestone because of inefficient surveillance systems and public health services at the community levels where outbreaks typically start.

The Tanzania government has undertaken several measures to strengthen its public health system, including strategies to improve various areas of the health sector. Notable steps included investments in infrastructure, new healthcare facilities, and renovating existing facilities. The government also strengthened healthcare financing, ensuring more citizens access to affordable and quality healthcare services. Moreover, public health campaigns have been established to educate the population on disease prevention, sanitation, and hygiene practices. Workforce development has remained a priority, focusing on the training and recruiting of healthcare workers to address the shortage of skilled personnel, especially at the sub-national levels. (Ministry of Health, Community Development, Gender, 2021a).

To link the formal health system with the community for early detection, reporting, and timely response to outbreaks through measures that are community-relevant and to address the shortage of community-based healthcare workforce to ensure efficiency in the provision of essential healthcare services, the Ministry of Health in Tanzania has established community health workers (CHWs) at the hamlet/street level (the lowest administrative level) throughout the country. Each hamlet is served by two volunteering CHWs (one female and one male) recruited from the same hamlet. Once recruited, the CHWs are expected to be trained on the basic concept of health promotion before they start working at the community level. (Ministry of Health, Community Development, Gender, 2021b).

The Government of Tanzania is already committed to considering CHW as an employed cadre, although this has yet to be realized. At the village level, there is a CHW supervisor and the primary health facility in charge, who are responsible to the health promotion coordinator at the district level council level and subsequently to the health promotion coordinator at the regional level and the community-based health service program at the national level. (Ministry of Health, Community Development, Gender, 2021b).

Available evidence suggests that CHWs who are equipped, trained, motivated, remunerated, and supported with supervision and Personal Protective Equipment (PPE) have been critical to public health surveillance systems and maintaining essential health services during periods of disease outbreaks, especially in workforce-constrained settings. (Madeleine *et al.*, 2017; Scott *et al.*, 2018). Recent evidence has demonstrated the feasibility and significance

of deploying skilled and trained CHWs at the community level in Tanzania to enhance the functionality of the early warning and response system and efficiency in providing essential healthcare services. (Baynes *et al.*, 2017; Sindato *et al.*, 2021).

## Results and discussion

### ***Involvement of Community Health Workers in Response to Marburg Virus Disease***

During the Marburg Virus Disease (MVD) outbreak in Kagera region of Tanzania in March 2023, CHWs were among the frontline workforces. This article highlights several roles they played in the disease outbreak management cycle. We highlight our approaches to orient them to MVD and their roles in mitigating the outbreak. While performing their routine activities within the community, the CHWs detected and reported the deaths of unknown causes directly into the electronic Event-Based Surveillance platform. The cause of death was subsequently confirmed in the laboratory to be MVD. Following this confirmation, a rapid risk assessment identified Bukoba District Council and Bukoba Municipality as the two (out of eight) districts of Kagera to be at high risk.

To enhance their efficiency and strengthen the functionality of the health system at the community level, the Ministry of Health, collaboratively with development partners, recruited 1,324 CHWs from the identified high-risk areas, oriented them to the MVD outbreak and its management before they were deployed back to the areas they lived and were working. Previous experience has shown that CHWs are traditionally trusted and accepted by their community, thereby representing a valuable role in designing and operationalising community-centred health-related mitigations, contact tracing, and promoting best practices. The involvement of CHWs in community-based surveillance is a practice that has been reported to be impactful in other settings of the African region. During the Ebola Virus Disease in West Africa, CHWs supported the detection, reporting, contact tracing, and response to the outbreak. (Miller *et al.*, 2018).

In Mali, a CHW spotted a yellow tint in a woman's eyes and reported it to the primary health facility, an event that was subsequently confirmed in the laboratory. (Dr. Ochiawunma Akwiwu Ibe and Dr. Doudou Diop, no date). During the COVID-19 outbreak in Somalia, CHWs supported the detection of cases and contact tracing. (Nyagah *et al.*, 2023). Similarly, in the Plague outbreak in Madagascar and the Ebola outbreak in the Democratic Republic of Congo (DRC), CHWs were involved in strengthening community-based surveillance, particularly in conducting contact tracing and alert reporting. (O'Keeffe *et al.*, 2023).

We developed a one-day training material based on our approach to capacity-strengthening CHWs and experience gathered from participatory community-centric approaches during the COVID-19 pandemic in 2019-2021. We oriented the CHWs to the essential elements of MVD: detection, reporting, and response. The training package included awareness creation of MVD transmission, clinical manifestations, control and prevention practices, and community event-based surveillance. In addition, they were refreshed on matters related to working safely in the community, ethics consideration, and psychosocial support in response to the outbreak; previous approaches elsewhere reported enhancing the efficiency of CHWs in disease outbreak detection, reporting, and response through appropriate and relevant training. (Boyce and Katz, 2019).

The CHWs received infection prevention and control (IPC) and Information Education and Communication (IEC) materials, including posters, brochures, and banners. They were guided in the appropriate community engagement by collaborating with local leaders, religious leaders, ward health officers, and healthcare workers at the primary healthcare facilities. Similar

approaches have shown that when CHWs are effectively trained, motivated, supervised, and equipped with IPC and IEC materials, they effectively provide preventative, promotional, and limited curative services.(Boyce and Katz, 2019).

After the orientation, the CHWs were re-integrated into their respective communities with the support of local leaders. They were motivated to visit the community members at household levels daily and other gathering places, including markets and worshipping areas, for community engagement, sensitisation, and detection of clinical manifestations suggestive of MVD. To support efficient monitoring and reporting of signals of an MVD outbreak, two CHWs were assigned a hamlet or street to ensure that messages were delivered to every household, public place, institution, and place of worship.

The CHWs visited all 279 primary and secondary schools (reaching out to 328 661 students) and all 78,090 households in the two districts for awareness creation and sensitisation of preventive measures against MVD. They distributed 22,600 posters, 9,500 brochures, and 44 banners. We have learned that the CHWs supported communicating the MVD outbreak spread risk by playing an active role as community educators and mobilizers and promoting adherence to disease preventive measures. Residing from their community, this motivated packaging, delivery, and uptake of locally and culturally appropriate measures. They reduced the burdens felt by the under-staffed healthcare systems. Our approach is similar to that adopted to raise community awareness during the Ebola outbreak in Sierra Leone, whereby deployed CHWs visited households and public places.(Perry *et al.*, 2016; Miller *et al.*, 2018).

Local and religious leaders augmented the efforts of CHWs in Kagera Region as it happened in other countries like Côte d'Ivoire during the Ebola outbreak to enhance behavioral changes. (Gautier *et al.*, 2017)They helped with community engagement and health awareness sessions, sensitized people on hygiene measures to reduce the risk of exposure and infection, and addressed matters related to rumors and misconceptions in the community. They also used motorcycles equipped with megaphones to cover mitigations in the hard-to-reach areas.

Daily monitoring of CHWs' activities conducted by their local supervisors and officers in primary health care facilities helped ensure that the CHWs adhered to disease prevention and control measures and worked safely in the community. At a regional level, meetings were organised every morning to discuss the compiled report, which helped track and advise accordingly on the areas and gaps that needed improvement. A rapid assessment survey indicated that public health promotion efforts and reliable sources of information about the disease outbreak at the community level were primarily (82.4%) attached to CHWs, followed by a mobile van with a public announcement system, radio broadcasts, and key influential people.

Our participatory approaches, which recognized the value and position of CHWs in developing IEC materials and dissemination mechanisms, ensured that the interventions were culturally relevant for community members' uptake. A growing appreciation and consensus indicate that participatory community-centred approaches like ours in health education and promotion initiatives have significantly enhanced adoption and compliance with new interventions. (Golden and Earp, 2012).

Based on their active participation and roles, we plausibly suggest that the CHWs contributed substantially to the detection, reporting, and response to MVD and other efforts implemented to control the MVD outbreak in the country. Available evidence suggests that the involvement of trained CHWs in community-based surveillance prevents the spread of infectious disease outbreaks. (Perry *et al.*, 2016). Continuous training, compensation for their efforts, and supervision are essential for their efficiency in health promotion services and disease surveillance. (Madeleine Ballard, Amy Madore, Ari Johnson, Youssouf Keita, Elsa Haag, Daniel Palazuelos, Julie Rosenberg, 2017).

## Conclusion

We have added further evidence to the existing experiences on the role of CHWs in providing health care services and enhancing the efficiency of surveillance systems, especially in the health systems facing human resource shortages for effective outbreak management. We have learned how the CHWs played an essential role as frontline sensors of MVD outbreak in Tanzania by detecting and reporting the initial cases.

Orienting them to the context of interventions against specific health problems and providing them with infection protective equipment, continuous supervision, and remuneration seem to enhance their efficiency and allow them to work safely in extending health services to the community level. Specific studies could provide broader evidence-based guidance on the best policy and practice options to sustain the efficiency, remuneration, and motivations of CHWs as they are currently working voluntarily.

## Ethical considerations

Approval to publish this article was sought from the Medical Research Coordinating Committee of the National Institute for Medical Research, Tanzania.

## Author contributions

EAM contributed to the idea's conception, acquired, analysed, and interpreted the data, and drafted and revised the manuscript. CS assisted in writing the manuscript and revised and edited the final draft. TH assisted in reviewing the manuscript. EGM, GM, JM, EK, FJ, LS, FK, MY, EM, MK, EK, MTM, MM, and PH contributed to writing and reviewing the manuscript. TN contributed to reviewing the manuscript. All authors read and approved the final manuscript.

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