Building Bridges: The Role of Effective Community Engagement Strategies for Mpox Prevention and Response

Kelechi Wisdom Elechi[1], Toluwalashe Soyemi[2], Oyelude Anuoluwa[3], Okechukwu Clinton Ifeanyi[4], Obed Mercy Adaobi[5], Okoli Chidera Godfrey[6], Alabi Joshua Opeyemi[7], Samuel Chijioke Ikechukwu[8], Offor Onyebuchi Oliver[5], Adetoye Ezekiel Adedapo[7], Ugwoke Evelyn Chioma[5], Elechi Ubalaeze Solomon[9], Akujuobi Chinemerem[10], Olabode Ekerin[11]

[1]Graduate School of Biomedical Sciences, University of Texas Health Science Center, San Antonio, Texas, USA.
[2]Department of Medicine and Surgery, Lagos State University College of Medicine, Ikeja, Nigeria.
[3]Department of Medicine and Surgery, College of Health Sciences, Bowen University, Iwo, Osun state, Nigeria.
[4]Department of Optometry, Faculty of Life Sciences, University of Benin, Edo, Nigeria.
[5]Department of Clinical Pharmacy and Pharmacy Management, Faculty of Pharmaceutical Sciences, University of Nigeria Nsukka.
[6]Department of Biochemistry- Faculty of Natural Sciences, Chukwuemeka Odumegwu Ojukwu University Uli Anambra state
[7]Department of Community Health and Primary Healthcare, Lagos State University College of Medicine, Ikeja Nigeria.
[8]Department of Medical Laboratory Science - Faculty of Health Science and Technology, Ebonyi State University.
[9]Department of Radiography and Radiological Sciences, Faculty of Health Science and Technology, University of Nigeria Enugu Campus, Enugu, Nigeria.
[10] Department of Radiography and Radiological Sciences, Faculty of Health Science and Technology, University of Uyo, Nigeria.
[11] College of Education and Human Sciences, University of Nebraska-Lincoln, Nebraska, USA.

Corresponding Author
Kelechi Wisdom Elechi
E-mail: kelechiwisdom20@gmail.com
Postal address: 7703 Floyd Curl Dr, San Antonio, Texas, 78229, USA P.O BQ

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Background and study aim: The review article explores effective community engagement strategies for Mpox prevention and response. Key approaches include targeted education campaigns, behavioral change communication, community-based surveillance, and engagement of underserved populations. Community participation in outbreak containment and collaboration with health authorities is emphasized. Case studies from Nigeria and Sudan demonstrate successful community-official partnerships in Mpox outbreak responses. The effectiveness of engagement strategies is evaluated, and policy implications are discussed, recommending integration of

community involvement into national Mpox prevention frameworks. Crucial policy considerations include prioritizing high-risk groups, establishing clear guidelines, allocating sufficient resources, and ensuring inclusivity.

Conclusion: For effective global Mpox control, a multifaceted approach involving community engagement, targeted interventions, improved surveillance, and vaccination programs is needed. By implementing comprehensive strategies that leverage community participation and address the zoonotic nature of the disease through a One Health approach, significant progress can be made in Mpox prevention and control efforts worldwide. This review underscores the critical role of community engagement in creating sustainable and effective public health interventions for Mpox.

INTRODUCTION

Globally, the impact of infectious disease outbreaks has been experienced by various communities, from Ebola to COVID-19 and the current endemic, Mpox, which has claimed many lives [1-3]. The community is a critical component and an active stakeholder in the prevention of and response to these infectious disease outbreaks[4].

Mpox was initially discovered in 1958 with a resurgence in 2022, which led to its declaration as a 'Public Health Emergency of International Concern' by the World Health Organization (WHO) on June 23rd, 2022 [5,6]. It is a zoonotic viral disease, first found in monkeys, and belongs to the same family as smallpox, Poxviridae, and genus Orthopoxvirus [7]. Despite its name, Gambian pouched rats have also been found to play an important role in its transmission [8]. The regional burden of Mpox varies significantly, with certain regions experiencing higher case counts and mortality rates, as shown in Table 1.

Table 1. Epidemiological Statistics of Mpox by Region

This table provides epidemiological data on Mpox outbreaks, showing confirmed cases, suspected cases, and deaths across different regions. Data are sourced from WHO and Africa CDC for the period between January 2022 and August 2024.

Region	Confirmed Cases	Suspected Cases	Deaths	Reporting Period
D. Republic of Congo	20,000+	25,000	100+	Jan 2022 – Aug 2024
Nigeria	800+	1,000+	5	Jan 2022 – Aug 2024
Central African Republic	200+	400+	3	Jan 2022 – Aug 2024
Burundi	400+	600+	10	Jan 2022 – Aug 2024

The Mpox virus (MPXV) is a double-stranded DNA virus with two clades identified; clade I (more virulent, endemic to Central Africa particularly the Democratic Republic of the Congo) and clade II (less virulent, endemic to West Africa, with subclades IIa and IIb) [5,6]. Mpox is clinically characterized by a rash that erupts on or near the genitals, anus, or other parts of the body. It may be associated with itching or pain with a probable phase of fever, headache, myalgia, or enlarged lymph nodes, occurring before, concurrent with, or after the eruption of the rash [5]. Transmission via contact with infected animals, contaminated fomites, and infected humans through their respiratory droplets or sexually has led to its steady spread from the index human case in 1970 till date [6]. Preventive measures such as hand washing, avoiding close contact with aerosols and body fluids of infected persons, and potentially contaminated fomites such as beddings, clothes or sharp objects have been implemented [7,9]. Combined with other protective measures, pox vaccines have been approved, especially for individuals in proximity to pox-infected persons [7,9]. One such vaccine, the JYNNEOS vaccine, a non-replicating modified vaccinia Ankara-Bavarian Nordic (MVA-BN) strain was approved in 2019 and has been beneficial due to its effective pre-exposure vaccination and fewer side effects [10,11].

According to the WHO external situation report of the multi-country outbreak of Mpox, a total of 99,176 laboratory-confirmed cases were accrued between 1 January 2022 and 30 June 2024 with 208 deaths reported, covering 116 territories, with the highest burden being in the Democratic Republic of Congo [10]. Compared to May 2024, the African Region reported a rise in case counts in June 2024 with 934 new cases. However, the true burden was said to be underestimated, likely due to the limited access to testing facilities in rural communities, lack of awareness, self-medication, and underreporting of disease [7,10].

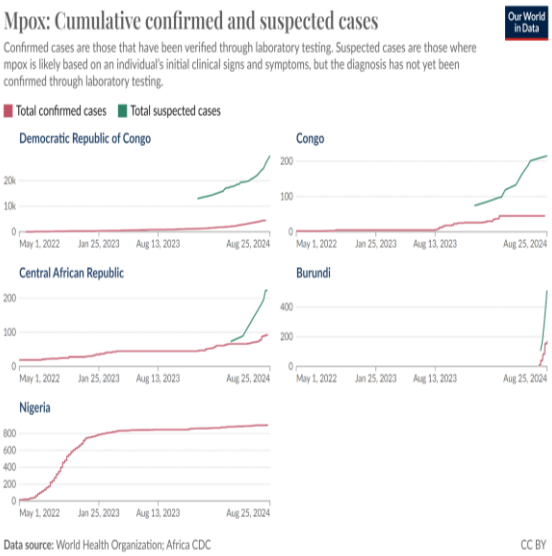

Figure 1. Mpox: Cumulative confirmed and suspected cases by country.

The figure illustrates the cumulative number of confirmed and suspected Mpox cases in five African countries (Democratic Republic of Congo, Congo, Central African Republic, Burundi, and Nigeria) from May 1, 2022, to August 25, 2024. Confirmed cases (red line) are verified through laboratory testing, while suspected cases (green line) are based on clinical signs and symptoms without laboratory confirmation. The graph highlights significant regional variations, with the Democratic Republic of Congo reporting the highest confirmed cases, followed by notable increases in suspected cases in Congo and Burundi in late 2024. Data are sourced from the World Health Organization and Africa CDC.

To create successful outbreak response solutions, two-way communication between the affected communities and the response authorities must be initiated [12]. This creates a shared responsibility to design culturally appropriate and sustainable initiatives that improve population health. This is harmonized with the active involvement of community members in surveillance, data gathering, leadership, execution, and evaluation of crafted prevention programs throughout the outbreak response cycle [9,12].

Our collective goal is to reduce morbidity and mortality by informing, empowering, and engaging communities to achieve good health impact and outcomes [12]. Historically, studies have shown the necessity of community-based approaches in navigating complex health issues including infectious disease outbreaks [9]. With the right tools and support, communities are capable of conducting localized surveillance of the disease [13]. This is exemplified in the community-based interventions that led to the improvement seen in Ebola virus disease (EVD) prevention and control as seen in a scoping review done in 2023 using Embase and MEDLINE databases. Through the EVD response efforts, awareness and behaviors toward the disease were also improved [9]. Factors including the proximity to a medical facility, testimonials of individuals who survived, and the role of community heads in earning the trust of the members, markedly contributed to the decline of the epidemic [9].

Community engagement was also noted to be successful in a cross-sectional study done in Abakaliki, Ebonyi state in Nigeria in 2020 when implemented in the prevention and control of Lassa fever [14]. Heads of households in Abakaliki were able to ensure good knowledge of the disease, environmental hygiene, hand washing, and proper food hygiene by avoiding the consumption of food contaminated by rats. 86.7% of 420 respondents were said to be aware of its means of transmission with the use of media [14]. With the fragile health systems in low and middle-income countries (LMICs), informed communities armed with the knowledge of the disease, the importance of vaccine uptake, proper hygiene, and care facilities are more likely to have better health-seeking behavior. Hence, the risk of Mpox is reduced and high-risk individuals including immunocompromised patients with HIV, young children, pregnant women, and the elderly are protected [12].

The objective of this article is to analyze actionable strategies that create effective community engagement and the necessity of their integration in Mpox prevention and response.

2. Community Engagement in Mpox Prevention

2.1 Awareness and Education

Awareness and education about Mpox in communities are crucial to limiting the spread of the disease. They empower individuals with the knowledge to recognize symptoms, understand

how the virus spreads, and adopt preventive measures [15]. The Mpox outbreak, which began in May 2022, after a year had spread to over 100 countries and all six regions of the World Health Organization [16]. The current epidemic has proven the global population is generally susceptible to this disease, which can spread from person to person through direct contact with lesions on the skin, upper respiratory secretions (snot, mucus), bodily fluids, or lesions around the anus, rectum, or vagina and can pass the virus to the fetus during pregnancy or to the newborn during and after birth, and indirect contact with contaminated fomites [17].

Given the potential risks associated with mpox outbreaks and the importance of education about infectious diseases, an interactive health education program focused on mpox is a valuable tool for promoting awareness and prevention of the disease [18]. Such programs create awareness and education on the signs and symptoms of mpox, methods of transmission, and strategies for prevention and treatment [19]. They also address common misconceptions about the disease and strengthen knowledge through group discussion [20].

Figure 2. Monkeypox symptoms and prevention strategies.

The infographic highlights the symptoms and prevention measures associated with Monkeypox (Mpox). Symptoms include fever, headache, swollen lymph nodes, rashes on the face and body, muscle aches, and backaches. The incubation period typically lasts 7–14 days but can range from 5 to 21 days. Prevention strategies illustrated include avoiding contact with animals that may harbor the virus, avoiding infected materials or clothes, washing hands regularly, and consuming properly cooked foods.

Key strategies for raising awareness and educating communities include:

1. Public awareness campaigns: As learned from the fight against the COVID-19 pandemic, public awareness and knowledge have always proved crucial for disease prevention and control in the community, suggesting a role of disease awareness in facilitating preventive practices [21].
2. Strong collaboration with national rapid response teams: In 2021, Nigeria quickly contained an outbreak of mpox within a month in Akwa Ibom state through strong collaboration with national rapid response teams, identifying and correcting weaknesses in the response, and providing education and recommendations to improve future responses [22].
3. Development of targeted messages: The development of messages and public health approaches is a key strategy by communities and health workers to reduce misinformation and stigma [23,24].
4. Fostering partnerships: The WHO has made test kits available to all countries and fostered partnerships as a strategy to enhance access to vaccines and treatments [25].

Figure 3. A comprehensive framework for community health awareness strategies in Mpox prevention. *The diagram outlines the four key pillars of community health awareness: (1) public awareness campaigns, (2) collaboration with national rapid response teams, (3) development of targeted messages, and (4) fostering partnerships. Each component is interconnected, demonstrating the holistic approach needed for effective Mpox prevention*

and control at the community level.

2.2 Behavioral Change Communication

Promoting preventive behaviors, which are actions and practices that individuals and communities can adopt to reduce the risk of contracting and spreading the virus, is essential for reducing the spread of Mpox. Using a two-dose mpox vaccination campaign, the JYNNEOS® vaccine, and high-risk population awareness and behavioral changes [26], the US was able to combat the mpox epidemic in 2022–2023 which caused over 30,000 cases and 32 deaths.

Behavior change communication, an interactive process with communities to develop tailored messages and approaches using a variety of communication channels to develop positive behaviors, has been shown to aid the prevention of both communicable and non-communicable diseases in public health [27]. It was noted that spontaneous behavior change, entailing a reduction in the frequency of sexual encounters and an increase in safer sex practice in Men sleeping with men (MSM) communities reduced the mpox transmission rate in the sexual network and clubs by approximately 60 and 85%, respectively, at the beginning of June 2022 [28].

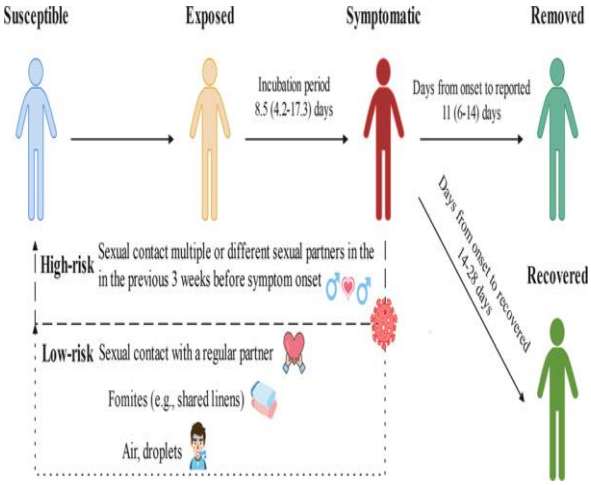

Figure 4. Natural history of Mpox virus infection and transmission dynamics. *The figure demonstrates the progression of infection from exposure to symptom onset, including the incubation period, prodromal phase, and rash development. Different colored indicators represent various stages of disease progression and potential transmission points, highlighting the importance of early detection and isolation measures. Reproduced from Yang et al., 2023, with permission under the Creative Commons Attribution License (CC BY). Published by Springer Nature in BMC Infectious Diseases. The original study models the natural history of Mpox transmission, highlighting incubation periods, symptom progression, and risk stratification. Citation: Yang et al., BMC Infectious Diseases, 23, 119 (2023).*

Promoting preventive behaviors through targeted communication requires the following:

1. Target-specific approaches: A successful behavior change is target-specific and is different from the ordinary instructional method of communication [29]. It requires much research and meticulous planning about the knowledge content of the subject and the behavior/attitude pattern of the target group such as healthcare workers, men who have sex with men (MSM), and individuals in close-contact settings [30].
2. Tailored communication strategies: Targeted communication has shown to be essential for ensuring that preventive behaviors are adopted by specific groups, those involved in risky sexual behaviors like having multiple sexual partners and being clients of sex workers who are at higher risk of Mpox transmission [31].
3. Utilization of diverse communication channels: Through the use of television, the awareness about mpox was high, and surprisingly the most frequent source of information [32]. A study by Ren et al. (2023) in their survey showed the most common medium of learning about Mpox was the Internet or social media followed by the TV or the radio, people around, and health education activities in the community [15]. This suggests that people who are hard to reach and undergo risky sexual behavior could be targeted through this medium in future educational health promotion campaigns.

3. Community-Based Surveillance and Detection

3.1 Training Community Health Workers

To successfully monitor and report health incidents, volunteers must undergo training on

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such infections or diseases. This increases community awareness and improves responsiveness to health concerns.

The global community witnessed a resurgence in the number of Mpox cases reported worldwide, prompting the World Health Organization (WHO) to declare the ongoing multicounty outbreak a public health emergency in July 2022 [5].

According to a study conducted by Ali et al. (2024), the need for public awareness of mpox emphasizes the urgent need for targeted health education programs to improve public understanding of mpox, which entails understanding transmission and preventive measures of MPXV [33]. Community-based surveillance is seen as an essential tool for monitoring public awareness and knowledge about mpox, as it fosters a sense of involvement and responsibility towards public health. The observational data collected on cases of mpox indicated that the outreach campaign organized by the United Nations International Children's Emergency Fund (UNICEF) on community-based surveillance contributed to the detection of suspected cases of MPXV in refugee settlement areas in the DRC [34].

Community-based surveillance (CBS) is an active process of community participation in detecting, reporting, responding to, and monitoring health events in the community. In addition, CBS ensures the highest level of coordination and cooperation. Sensitization events, training sessions, advocacy campaigns, and the use of various media platforms, including integrating integrated disease surveillance messaging into the intervention program activated, can be achieved using CBS [35].

Community-based surveillance (CBS) differs from traditional disease surveillance. Traditional disease surveillance is based on data collected by health institutions, and such data typically consists of information such as morbidity and mortality data, laboratory reports, individual case reports, field investigations, surveys, and demographic data. These data are generally collected by physicians, public health laboratories, hospitals, and other health providers and institutions [36].

The World Health Organization revealed that one of the problems being faced in the prevention of the re-emergence of mpox was the lack of knowledge about the virus, particularly among healthcare workers (HCWs) [37]. Despite the high awareness level of MPXV infection among healthcare workers, there still exists a huge knowledge gap, especially in identifying the symptoms and prevention of mpox, and the investigation and treatment of MPXV infection [38]. Ali et al. (2024) highlighted why health workers fail to identify mpox cases due to several limitations, including limited awareness among the healthcare providers about the disease, poor diagnostic capacity, and that several diseases with comparable skin symptoms are endemic to the nation [33].

3.2 Participatory Surveillance: Utilizing Community Networks for Real-Time Reporting

With the continuous rise in the global threat of infectious diseases like monkeypox, improving public knowledge is essential for containment and mitigation of MPXV transmission and the onset of symptoms [39]. Participatory disease surveillance involves the collection of data for public health action by directly involving the population at risk in submitting relevant data through a variety of survey tools, such as sophisticated mobile phone apps to simple hotlines. It involves asking people to provide data, which helps in improving the understanding of disease risk and patterns of transmission as such disease [40].

According to Smolinski et al. (2017), informing participants of the hazards of endemic diseases through direct engagement may also help to speed up response times for public health emergencies [40]. When it comes to low-cost, population-based monitoring on a wide scale, participatory surveillance presents numerous benefits. The system becomes more sensitive as the number of users rises. When compared to traditional healthcare-based surveillance systems may underestimate the true burden of disease because of individual behavior. Participatory surveillance systems have the potential to involve individuals who might not typically communicate with healthcare clinicians because of cultural conventions, lack of access, or other limitations. In addition to sentinel provider networks, participatory surveillance can offer a more comprehensive assessment of the disease burden in a population if the participation is high

enough and representative of the broader population. Gathering information about the general public, many of whom would not be included in other monitoring systems, can be quite advantageous, especially when performed with the speed enabled by digital reporting [40]. Smolinski et al. (2017) also highlighted that participatory disease surveillance provides flexible data systems and user interfaces that let health authorities quickly modify the data elements being gathered and disseminate information in near-real time [40].

In the 21st century, public engagement is being transformed through participatory surveillance systems that enable the public to directly report on diseases via the Internet. By employing the use of computers or smartphones, these systems encourage members of the public to regularly and voluntarily submit syndromic health-related information. Quick feedback to users and reported data are aggregated and visualized in near real-time, allowing immediate feedback to users and public health agencies, which is made possible by real-time aggregation and visualization of reported data. Quicker data delivery and direct public outreach through online discoveries present chances to enhance disease surveillance [41].

One of the ways of utilizing community networks for real-time reporting of mpox cases is actively engaging with the community through public healthcare workers and community volunteers. The use of community volunteers in reporting cases and events that can affect human life increases the sensitivity of the surveillance system in general endemic areas, where no health facility is located. Also, the community volunteers have a great role in providing awareness for the community members to visit the health facility when they feel sick. The selection of community volunteers is done according to standard criteria approved by the Federal Ministry of Health [42].

Participatory surveillance strategies involve community volunteers reporting health incidents, collaborating with health professionals and community-based organizations, establishing a federal task force for active surveillance, and utilizing local knowledge for quicker identification and reporting of health occurrences, particularly in socially vulnerable communities.

4. Engaging Underserved Populations

4.1 Reaching Remote Communities

Traveling to distant communities is vital for efficient mpox engagement, especially in distant locations where the virus is endemic [43]. The establishment of trust with local rulers is essential to improve mpox case reporting, diagnosis, and treatment [44]. An article published by Morbidity and Mortality Weekly report found that community-based initiatives, led by community rulers, significantly improved mpox vaccination uptake in distant areas [45]. Culturally dependent concepts are important when involving distant communities. Mpox education and equipment to local customs, languages, and values can enable awareness of the prevention and treatment criteria [46]. Mobility services can help deliver mpox testing, vaccination, and treatment to far-to-reach areas [47]. Technical support like digital platforms provides education and contact tracing and can also hasten engagement in distant areas [48]. Alliances with local bodies, governments, and stakeholders are important to developing mpox response efforts [49].

5. Community Participation in Response Efforts

5.1 Involvement in Outbreak Containment

Effective containment of Mpox outbreaks involves an extensive approach comprising:

1. Vaccination Strategies: Pre-exposure prophylaxis has demonstrated a significant decrease in the incidence of infections, making it very useful in reducing the risk and degree of potential major outbreaks [50]. The Jynneos vaccine has been successfully used under Emergency Use Authorization to contain mpox outbreaks [51]. Vaccination coverage and its effectiveness across different regions are summarized in Table 2, highlighting the role of JYNNEOS in outbreak control.
2. Community Involvement: The World Health Organization (WHO) recommends that countries adopt risk communication and community engagement (RCCE) as an approach to mitigate the transmission of infection.

This has led to the establishment of partnerships between academia, community, and government [52].

3. Public Health Response: Systematic data gathering, focused actions, and the use of standard personal protective equipment (PPE) by healthcare workers have played crucial roles in controlling Mpox outbreaks [53,54].
4. Public Awareness and Education: The prompt establishment of health education programs is crucial to facilitate the implementation of knowledge-attitude-practice (KAP) in combating Mpox within communities [55].

Table 2. Vaccination Coverage and Effectiveness

This table summarizes vaccination coverage and effectiveness in different countries during the Mpox outbreak, highlighting the role of JYNNEOS and other vaccines.

Country	Vaccine	Vaccinated (%)	Effectiveness (%)	Reduction in Cases
United States	JYNNEOS	70%	85%	Sig (~30,000 cases)
Nigeria	Smallpox-derived	40%	70%	Moderate
D. Republic of Congo	None	0%	N/A	Ongoing outbreaks

5.2 Collaboration with Health Authorities

Successful collaboration between communities and health authorities is crucial for effective mpox prevention and response. Case studies have shown that partnerships between community organizations, academic institutions, and government agencies can lead to more comprehensive and culturally appropriate interventions [52].

Key aspects of successful collaborations include:

- Establishing clear communication channels between community leaders and health authorities.
- Involving community members in decision-making processes regarding mpox prevention and control strategies.
- Leveraging local knowledge and resources to complement official health interventions.
- Providing regular feedback and updates to the community on the progress of mpox containment efforts.

5.3 Case Studies of Successful Community-Health Authority Partnerships

Outbreak Of Mpox in Nigeria 2017-2018

In September 2017, Nigeria reported its first case of monkeypox in nearly 40 years. The initial case, detected in Bayelsa State, triggered national and international concern due to the zoonotic nature of the disease and the potential for widespread transmission. By February 2018, the outbreak had spread to 24 of Nigeria's 36 states and the Federal Capital Territory, resulting in 228 suspected cases, 89 confirmed cases, and six deaths [56].

Joint field investigations were carried out and in collaboration with the community, the communications team developed and executed a plan that was targeted at allaying the public fear and apprehension concerning this highly infectious disease. It is also worth noting that principal messages, press releases, and frequently asked questions among other key contents were put out to address conceivable risk factors that were recognized during investigations [57].

This has led to the implementation of the "One Health Approach" that involves collaboration among health care providers, community, animals, and environmental health institutions.

Mpox in Khartoum, Sudan in 2022

In 2022, Sudan, particularly Khartoum, faced significant public health challenges due to the emergence of Mpox (formerly known as Monkeypox). In response, the Ministry of Health, in collaboration with international partners such as the World Health Organization (WHO) and the European Civil Protection and Humanitarian Aid Operations (ECHO), developed a comprehensive Pandemic Preparedness and Response (PPR) action plan. This plan was focused on improving

coordination between human and animal health stakeholders, enhancing community engagement through modified risk communication, and strengthening active surveillance, case finding, and management [58].

Key elements of the response included the training of local health workers, provision of necessary medical supplies, and deployment of rapid response teams. WHO's support extended to providing vehicles, personal protective equipment (PPE), and technical assistance to ensure a swift response to alerts, reducing the time for action from 2-3 days to under 24 hours. The Ministry of Health emphasized community-based surveillance and the integration of Mpox preparedness into broader health emergency frameworks. This strategy proved crucial given the concurrent health crises, including COVID-19 and vector-borne diseases like malaria and cholera [59,60].

Despite the challenges posed by political unrest and a fragile economy, these efforts allowed Sudan to maintain some level of control over the spread of Mpox, although ongoing support and improved coordination were necessary to address the gaps in healthcare delivery and outbreak response effectively [58,59].

6. Evaluation and Policy Implications

6.1 Assessing Engagement Effectiveness

Assessing the effectiveness of community engagement strategies is essential for understanding their impact and identifying areas for improvement. Effective evaluation helps determine the success of interventions, guides future strategies, and ensures that resources are allocated efficiently. According to expert consensus in Ontario, Canada, five critical threshold indications of mpox outbreak containment or effectiveness are as follows: The estimated number of actively infectious cases is less than 5, the effective reproductive number is less than 1.0, the doubling time is more than 42 days, the weekly test positivity is less than 5%, and there are rare non-gay, bisexual, or men who have sex with men (gbMSM) instances (female and pediatric cases) [61].

Evaluation methods can include qualitative and quantitative approaches such as surveys, focus groups, interviews, and outcome analysis [62]. These methods assess various factors, including community participation, knowledge retention, behavior change, and the overall impact on Mpox transmission rates.

One critical aspect of evaluating community engagement is assessing the level of community participation. High levels of community involvement often correlate with better outcomes, as engaged communities are more likely to adhere to preventive measures and participate in surveillance and response activities [63]. Surveys and focus groups can gauge the community's understanding of Mpox, their perceptions of risk, and their willingness to engage in prevention and control efforts. Outcome analysis can then link these perceptions to actual changes in behavior, such as increased reporting of suspected cases or improved adherence to vaccination campaigns [63].

Evaluations of past Mpox interventions have provided valuable insights into the factors that contribute to successful community engagement. One key lesson is the importance of early and continuous communication with affected communities. For instance, during the 2022 Mpox outbreak, studies highlighted the need for targeted communication with vulnerable groups, such as men who have sex with men, children, and immune-compromised persons [64,65]. Early engagement with these communities helped to build trust and facilitated the dissemination of critical information, leading to more effective prevention efforts.

Flexible approaches are also crucial for adapting to changing circumstances. The COVID-19 pandemic underscored the importance of adaptability in public health strategies. For example, sexual health clinics had to quickly adjust their operations to continue providing essential services while minimizing the risk of infection. This experience is directly applicable to Mpox, where the ability to modify engagement strategies in response to new information or shifting community needs can significantly enhance the effectiveness of interventions [65].

A successful example of evaluating community engagement comes from the 2014-2016 Ebola outbreak in Sierra Leone. During this outbreak, the Community Led Ebola Action (CLEA) implemented a feedback mechanism through the Social Mobilization Action Consortium (SMAC) consisting of a group of 2,466 community facilitators, more than 6,000 religious leaders,

and 42 indigenous radio stations across the 14 districts of Sierra Leone involving regular sessions with community members [66]. These sessions provided a platform for community members to express their concerns, share their experiences, and offer suggestions for improving the response efforts. The feedback gathered was instrumental in monitoring and adjusting strategies in real-time, leading to more effective engagement and a more efficient outbreak response [65,66]. This approach highlights the value of incorporating community voices into the evaluation process, ensuring that interventions are responsive to the actual needs and preferences of the community.

Furthermore, insights from other public health challenges, such as HIV prevention, can also be applied to Mpox control. For instance, efforts to reduce stigma and improve the quality of life for affected individuals are crucial components of both HIV and Mpox interventions [67]. Reducing stigma not only encourages individuals to seek care and report symptoms but also fosters a more supportive and inclusive environment that is conducive to effective community engagement. Applying these lessons to Mpox can help ensure that interventions are not only effective in controlling the spread of the disease but also in promoting the well-being of those affected.

6.2 Policy Recommendations

Integrating community engagement into national Mpox strategies is crucial for sustainable disease prevention and control [68]. Effective policies should establish a framework that supports continuous and meaningful community involvement in all stages of Mpox prevention, surveillance, and response. This integration ensures that community engagement is not an afterthought but a central component of public health strategies.

Prioritizing Key Populations

One of the key policy implications is the need to prioritize populations that are at higher risk for Mpox, such as gay, bisexual, transgender, and other men who have sex with men, immuno-compromised persons, and children [68]. These groups should be prioritized for prevention and treatment efforts, as they are often disproportionately affected by Mpox outbreaks [68,69]. Policies should support targeted engagement efforts, such as community-based consultations that involve representatives from these key populations. Additionally, addressing vaccine hesitancy within these communities is critical. Strategies may include culturally sensitive communication, involvement of trusted community leaders, and transparent information about vaccine safety and efficacy.

Establishing National Guidelines and Resource Allocation

National guidelines for community engagement should be developed and implemented, providing a clear framework for public health authorities and community organizations to follow [70]. These guidelines should outline best practices for engaging communities, including methods for involving marginalized groups, strategies for effective communication, and protocols for incorporating community feedback into decision-making processes.

Resource allocation is another critical aspect of policy development [71]. Sufficient resources must be allocated to support community-based initiatives, such as training programs for community health workers, public education campaigns, and participatory surveillance efforts [72]. Ensuring that these initiatives are well-funded and supported by both government and non-governmental organizations will enhance their effectiveness and sustainability.

Incorporating Community Feedback into Policy Development

A cornerstone of effective community engagement is the incorporation of community feedback into policy development [66]. Policies should not be developed in isolation but should reflect the needs, concerns, and preferences of the communities they are intended to serve. This approach not only enhances the relevance and effectiveness of public health interventions but also fosters a sense of ownership and responsibility among community members, which can lead to more successful outcomes.

Ensuring Inclusivity and Equity

Policies must emphasize the importance of inclusivity and equity [68], ensuring that all populations, including marginalized and underserved groups, are adequately represented and supported in Mpox prevention and response efforts [73]. This includes addressing social determinants of health, such as access to

healthcare, education, and economic opportunities, which can influence the vulnerability of different populations to Mpox. An equitable approach to policy development ensures that interventions do not inadvertently exacerbate existing health disparities but instead contribute to the overall well-being of all community members.

Strengthening Border Control and Contact Tracing

Improved and up-to-date documentation of individuals entering and leaving the country can significantly enhance contact-tracing efforts. Effective contact tracing is crucial for identifying exposed individuals, particularly when case numbers are low, and can prevent the spread of Mpox within and across borders [74]. Policies should also focus on tightening border controls and implementing rigorous screening procedures for both humans and animals during Mpox outbreaks. These measures are essential for preventing the introduction of the virus into new areas and for controlling its spread within affected regions.

Adequate Screening of Humans and Animals

Given that Mpox is a zoonotic disease, meaning it can be transmitted between animals and humans, cross-examination of both humans and animals during outbreaks is a critical policy consideration this is to prevent reverse zoonosis [69]. Veterinary and public health authorities should collaborate closely to monitor and control the movement of animals that could potentially carry the virus. Policies should support coordinated efforts between these sectors to ensure a comprehensive approach to Mpox prevention and control.

7- CONCLUSION

The prevention of monkeypox requires a two-fold approach: prompt treatment of infected people and implementation of public health policies. This can be achieved by promoting community engagement, improving the availability of vaccines and diagnostic test equipment, and also by increasing the funds allocated to its prevention [75].

Community effort is crucial to halt the spread of monkeypox. A major step that needs to be taken is to stop the stigmatization of groups with a higher prevalence, which has been observed in some countries where a significant percentage of cases were among the gay and bisexual community. This form of stigmatization can induce fear, discouraging people from seeking care in healthcare facilities, making identification of cases more difficult, and hindering contact tracing [76].

It is vital to communicate health risks to the population in an understandable and culturally appropriate manner, utilizing platforms that people are familiar with or involving trusted individuals. Education of the population concerning risk factors, symptoms, and preventive measures is a powerful tool in disease prevention, as it helps individuals make decisions that protect their health and that of the community. Efforts should be made to avoid the spread of misinformation, which can hinder public health measures [77].

Studies have demonstrated that educating the community about monkeypox symptoms, modes of transmission, and methods of reducing the risk of spread has improved disease recognition and health-seeking behavior among community residents [78]. This underscores the vital role of community education in monkeypox prevention.

The concept of One Health is crucial in controlling zoonotic infections such as monkeypox. One Health involves a collaborative and transdisciplinary approach to control diseases involving humans, animals, and the environment. Efforts involving humans alone are insufficient in controlling monkeypox, as it has been strongly linked to primates and some other animals such as squirrels. The environment is also important, as monkeypox infections are associated with tropical forest regions and disturbed agricultural zones. Practices such as collection, consumption, and selling of animal carcasses should be discouraged in these areas, especially when the cause of animal death is unknown [79].

Lessons from the COVID-19 pandemic have revealed loopholes in our public health emergency response system. It is crucial to improve our health system by enhancing surveillance systems and training community health workers. Community health workers have more contact with rural and low-resource communities; thus, equipping them with more resources and training will play a crucial role in monkeypox prevention [80].

Improving our surveillance and response system is vital in controlling the monkeypox virus. Continuous monitoring of the virus is necessary to determine its genetic modifications, anticipate possible epidemiological shifts, and prevent the occurrence of epidemics or pandemics. Necessary steps for effective surveillance include:

- Early detection of cases
- Rapid public health interventions (contact tracing, isolation, and quarantine)
- Early containment of outbreaks
- Identifying high-risk persons and places (with the aid of descriptive epidemiology)
- Monitoring viral evolution (necessary to predict epidemiological shifts)
- International collaboration [81].

Figure 5. MonkeyPox Surveillance Strategies framework showing the interconnected components of effective disease monitoring and control. The diagram illustrates the six essential elements of surveillance: early detection, rapid public health interventions, outbreak containment, risk assessment, viral evolution monitoring, and international collaboration. Arrows indicate the flow of information and actions between different components, emphasizing the cyclical and continuous nature of surveillance efforts.

The smallpox vaccine has been shown to offer some protection against the monkeypox virus, as both are orthopoxviruses. People vaccinated with the smallpox vaccine show less risk of developing monkeypox disease and are more likely to develop mild disease than unvaccinated people. Therefore, post-exposure vaccination of contacts of confirmed cases might also be an effective method of preventing monkeypox disease] 82.[

In conclusion, the monkeypox virus poses a significant epidemiological threat. Controlling the virus involves collaboration among health workers, communities, and governments. It also requires a One Health approach, recognizing the zoonotic nature of the disease. Sustainable environmental practices are essential to make this disease a thing of the past. By implementing comprehensive strategies that encompass community engagement, targeted interventions for high-risk groups, improved surveillance, and vaccination programs, we can work towards effective prevention and control of monkeypox on a global scale.

Ethical approval:

This study did not involve human participants or animals and did not require ethical approval.

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Availability of data and materials

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HIGHLIGHTS

- Case studies from Nigeria and Sudan demonstrate the efficacy of community-

official partnerships in managing Mpox outbreaks.

- A One Health approach, integrating human, animal, and environmental health perspectives, is crucial for sustainable Mpox prevention.
- Policy recommendations focus on prioritizing high-risk populations, improving surveillance systems, and ensuring resource allocation to community-based interventions.

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