Institutionalising public health emergency preparedness and responses in Africa: lessons learned during the 2022-2025 outbreaks with crossborder spread potential

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Lessons and best practices from outbreaks during 2022–25 in Africa were not comprehensively documented or shared to inform future outbreak responses. We conducted a narrative review of published articles and outbreak response reports of mpox, cholera, Ebola virus disease, and Marburg virus disease and captured experts' perspectives and lessons. We analysed and presented the data in themes. Evidence indicates that effective responses are built on routine investments maintained between outbreaks, particularly in decentralised laboratories, digital surveillance systems, community structures, and clinical trial readiness. The institutionalisation of response mechanisms through national public health institutes, incident management systems, and emergency operations centres reflects a maturing continental preparedness architecture, reinforced by rapid regional solidarity, south–south cooperation, and timely partner support. National political leadership was crucial in mobilising resources and ensuring public compliance, whereas innovations such as expanded genomic surveillance, timely deployment of investigational countermeasures, mobility-aware outbreak control, and improved early-warning systems strengthened responses to outbreaks. The successful control of these recent outbreaks highlights the importance of strengthening preparedness, institutionalising response systems, and fostering coordinated, Africa-led health security frameworks to support resilient and sustainable outbreak response.

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Introduction

During 2022–25, Africa's experience with concurrent, high-impact, public health emergencies served as an empirical stress test for the continent's health security architecture and offered crucial lessons for global preparedness. Between 2022 and 2025, countries across Africa faced overlapping outbreaks of mpox, Marburg virus disease (MVD), Sudan virus disease, Ebola virus disease, and resurgent cholera, with responses that were varied but increasingly coordinated at national and regional levels.

Mpox re-emerged as a continental priority in 2024, prompting the Africa Centres for Disease Control and Prevention (Africa CDC) to declare the first-ever Public Health Emergency of Continental Security (PHECS) in Aug 14, 2024. This declaration was thereafter mirrored by WHO, and mpox was declared as a Public Health Emergency of International Concern.[1,2] Subsequently, a continental Incident Management Support Team (IMST) was established immediately following the declaration to respond to the multicountry mpox outbreak. The IMST brought together more than 28 partners under the joint leadership of the Africa CDC and WHO to harmonise and implement approaches to addressing multicountry health emergencies within a one team, one plan, one budget, and one monitoring and evaluation framework, in line with the Lusaka Agenda.[3] The IMST provided overall leadership and coordinated the mpox outbreak response across ten response pillars—namely, collaboration and coordination, surveillance, laboratory (testing and diagnostics), case management, infection prevention and control (IPC), risk communication and community engagement (RCCE), vaccination, research and innovation, logistics and supplies, and continuity of essential health-care services.[3] Following a reduction in the prevalence and geographical spread, the Africa CDC lifted mpox from being a PHECS on Jan 22, 2026, in line with the recommendations of the Emergency Consultative Group.[4]

Several African countries have shown increasingly effective, science-driven responses to viral haemorrhagic fever outbreaks. Rwanda, Tanzania, and Ethiopia rapidly contained MVD through strong governmental leadership, routine integration of outbreak response measures into health services, and the use of investigational vaccines and therapeutics. An exceptionally low case-fatality rate (CFR) of less than 25% was observed in Rwanda, and Ethiopia declared its outbreak to be over after the WHO-mandated 42 infection-free days, within approximately 3 months of detection of the outbreak.[5] Uganda's 2025 Sudan virus outbreak further highlighted growing regional capacity; despite the absence of licensed countermeasures, Uganda swiftly launched the world's first Sudan virus vaccine efficacy trial within four days of confirmation of the outbreak, achieving a low CFR of 28·6% and marking a clear evolution from Uganda's response in 2022.[6,7] Similarly, the 16th Ebola virus outbreak in the Democratic Republic of the Congo was rapidly contained, illustrating the power of a structured incident management system that integrated surveillance, clinical care, ring vaccination, community engagement, and real-time data analytics, even in unstable settings.[8] Collectively, these experiences underscore Africa's expanding ability to align governance, research, and service delivery to control high-risk epidemics efficiently and sustainably.[9,10]

However, a disparity arose in terms of response capacity among the countries; thus, some countries could mitigate the impacts of the outbreaks rapidly with minimal CFRs,

unlike other countries that recorded higher CFRs. This disparity in response efforts indicates the difference in preparedness levels of the countries, underscoring the need for knowledge exchange and lessons for future preparedness. Nonetheless, the lessons learned, experiences, or best practices have not been comprehensively documented, which restrict the ability to consolidate the gains obtained and hinder the continent's capacity to fully translate the lessons into sustained preparedness for future outbreaks. Previous studies, reviews, and lessons learned documentation were fragmented and did not include a comprehensive picture of outbreak response measures across the continent. Continent-level and national-level outbreak response efforts were not comprehensively documented, hindering the institutionalisation of lessons to inform preparedness and timely responses to future outbreaks. In this Health Policy, we describe the lessons learned, experiences, and best practices of the response measures to major outbreaks in African countries.

See Online for appendix

Methods

We conducted a narrative synthesis of scientific articles and reports. This method enabled a flexible, comprehensive exploration of articles and reports to synthesise broad lessons and experiences in outbreak response in Africa.[11] The broad questions examined in this Health Policy were what lessons were learned and what experiences and best practices were identified from the recent outbreaks of mpox, MVD, Ebola virus disease, and cholera in African countries. We focused on mpox, MVD, Ebola virus disease, and cholera because these multicountry outbreaks were recognised as grade 3 (requiring continental-level support to respond) by the Africa CDC.

Search strategy and selection criteria

We retrieved relevant scientific literature; official progress reports from national, regional, and continental bodies; meeting and discussion reports; and intra-action and after-action reports specific to the mpox, MVD, cholera, Sudan virus disease, and Ebola virus disease outbreaks that were subsequently controlled across African countries.

We conducted a targeted search focusing on outbreak response lessons and operational experiences across major events, including the MVD response measures in Rwanda, Tanzania, and Ethiopia; mpox response measures in the Democratic Republic of the Congo and other affected countries; the Sudan virus disease response measures in Uganda; the Ebola virus disease response measures in the Democratic Republic of the Congo; and multicountry cholera response measures. We searched PubMed, Scopus, and Google Scholar for relevant scientific publications using the following query terms, such as "mpox or Monkeypox" OR "Marburg virus disease or MVD" OR "Ebola", OR "Cholera". We kept our searches restricted to African countries (based on title and abstract) and to articles published from 2022 to 2025, without language restrictions We also manually screened the references of retrieved relevant articles and collected grey literature through Google search or direct searches of the websites of the National Ministry of Health, National Public Health Institutes, Africa CDC, and WHO. For some reports, such as progress reports and intra-action or after-action review reports, we directly contacted the emergency preparedness and response teams or IMST at Africa CDC. Eligible sources included peer-reviewed publications and grey literature such as national outbreak reports, provided that the title or abstract addressed at least one targeted outbreak. After screening the titles and abstracts, articles were excluded if they did not pertain to Africa or were unavailable in full text format.

Data extraction and synthesis

We used an in-house-developed data extraction tool (appendix p 7), we extracted outbreak response experiences, lessons, and best practices across the response pillars. We summarised and synthesised the captured and extracted data using a thematic analysis approach and presented the findings in a narrative format organised around the identified themes. We defined lessons learned as insights gained from analysing successes and failures, including what worked well, what did not, and why, during outbreak response measures. We defined experiences as the cumulative knowledge acquired by individuals, institutions, or systems that were directly involved in outbreak response activities. Such knowledge include real-world observations, contextual challenges, adaptive decisions, and operational realities that shape how responses were implemented. We defined best practices as evidence-informed, ethically sound, and context-appropriate approaches or interventions that have shown effectiveness, efficiency, and acceptance in managing outbreaks. These practices were captured for each theme (response pillar) of the outbreak response.

Key findings

We synthesised evidence from 66 articles and nine reports describing responses to mpox, MVD, cholera, Sudan virus disease, or Ebola virus disease outbreaks in Africa, continental-level mpox outbreak reports (progress, interaction, and legacy reports), and related outbreak response reports from African countries (appendix p 1). The key findings (lessons and best practices) for each response theme are summarised in the panel.

Governance and coordination

The outbreaks in Africa during 2022-2025 showed that centralised emergency declarations at the continental and national levels and unified incident management structures substantially accelerated multisectoral response actions. The Africa CDC's declaration of PHECS and the adoption of the one team, one plan, one budget, and one monitoring and evaluation response architecture during the mpox outbreak enabled rapid mobilisation of vaccines, personnel, and financing across countries.[3,10,12,13] Similarly, Sudan virus disease outbreak response measures in

Panel: **Response pillar-based categorisation of lessons learned and best practices identified from response measures during the 2022–25 outbreaks in Africa**

Coordination and leadership

Lessons identified

Continental and joint WHO–Africa Centres for Disease Control and Prevention (CDC) task forces and unified incident management systems accelerated multisectoral response actions

Examples of lessons learned and best practices

- Continental emergency declarations of mpox (Africa CDC's Public Health Emergency of Continental Security declaration, followed by WHO's Public Health Emergency of International Concern declaration) enabled rapid mobilisation of vaccines, funding, and technical support, including a one team, one plan, one budget, one monitoring, and evaluation framework incident management model and deployment of epidemiologists across countries
- Joint WHO–Africa CDC task forces and high-level regional meetings improved alignment of surveillance, laboratory, and response activities across borders
- Strong national emergency operations centres were instrumental in rapidly coordinating responses to outbreaks
- Engagement of national political leadership was pivotal to enhancing multisectoral collaboration and making swift decisions

Surveillance, diagnostics, and data use

Lessons identified

Decentralised PCR; integrated human–animal surveillance, community syndromic reporting; digitised contact tracing; and integrated genomic–epidemiological surveillance are decisive for early detection and influencing outbreak size and mortality risk

Examples of lessons learned and best practices

- Scaling the capacity of PCR built during COVID-19 pandemic resulted in all African countries having basic molecular tools for mpox testing; however, access in rural or fragile settings lagged; decentralising diagnostics and improving sample transport were identified as core best practices in mpox response
- Integrated sentinel and syndromic surveillance for mpox (including community-led approaches) was emphasised for early detection, especially in remote and zoonotic hot spots
- Electronic or event-based surveillance, 7-1-7 (7 days to detect an outbreak, 1 day to declare it, and 7 days to complete early response actions) targets, and community healthcare workers (CHW)-led reporting enabled early detection and containment during Marburg virus disease (MVD) outbreak responses
- Rwanda's outbreak showed the value of large-scale testing (6340 suspects; 66 confirmed cases), and refined, symptom-based case definitions that prioritise early non-haemorrhagic symptoms were key to identify cases sooner
- Field Epidemiology and Laboratory Training Program (FELTP) graduates played key roles in surveillance, data management, and infection prevention and control (IPC) coordination

Community engagement and communications

Lessons identified

Tailored risk communication and community engagement (RCCE), anti-stigma messages, use of trusted local channels, and CHW-led RCCE improve community trust and culturally grounded communication that determines the trajectory of outbreak containment

Examples of lessons learned and best practices

- RCCE was indispensable, particularly in conflict-affected eastern Democratic Republic of the Congo, where mistrust and insecurity undermined response; context-specific RCCE and One Health framing were crucial
- Anti-stigma messaging, use of local languages, and leveraging COVID-19 and Ebola virus disease communication networks were recommended to address vaccine hesitancy and misinformation
- CHWs were the dominant information channel crucial for RCCE

Vaccination

Lessons identified

Rapid deployment of vaccines fundamentally alter epidemic trajectories

Examples of lessons learned and best practices

- Rapid but insufficient mobilisation of mpox-effective smallpox vaccines illustrated both the strength and limitations of emergency donations; equitable, prepositioned supplies in endemic countries are a major lesson and underscore the need to accelerate local manufacturing and pooled procurement agendas forward

Case management and IPC

Lessons identified

Strengthened clinical management and referral, early intensive care unit (ICU)-level care and robust IPC for MVD, and use of remdesivir or MBP091 protocols for MVD improve clinical outcomes

Examples of lessons learned and best practices

- Early ICU-level care, standardised protocols, and strong laboratory capacity reduced MVD-related early deaths and should be prepositioned in high-risk regions
- Ring vaccination of frontline workers with ChAd3-MARV under emergency or clinical trial frameworks and stockpiling experimental tools emerged as a key MVD preparedness best practice

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Health system capacity

Lessons identified

Activities such as FELTPs to ensure baseline health system strength and promote preparedness activities, international partnerships, stockpiled countermeasures, and research and operations determine the outbreak response

Examples of lessons learned and best practices

- Outbreaks underscored the need to strengthen routine health infrastructure (laboratories, workforce systems, referral systems) rather than rely on ad-hoc vertical responses
- Strong pre-existing health systems, FELTP capacity, and rapid international support were key factors in successful outbreak response measures
- Mental health impacts on healthcare workers survivors, and bereaved families require integration of psychosocial support into outbreak plans

Real-time evidence generation and translation

Lessons identified

Embedded evidence generation and rapid evidence synthesis and translation substantially supports response efforts

Examples of lessons learned and best practices

- Integrate research with response efforts to generate evidence and support translation of evidence into response
- Implement real-time rapid evidence synthesis to support response efforts
- Systematically document and share lessons, best practices, and innovations

Uganda; MVD outbreak response measures in Rwanda, Tanzania, and Ethiopia; and Ebola virus disease outbreak response measures in the Democratic Republic of the Congo[14] benefited from well-established emergency operations centres (EOCs) and structured incident management systems, facilitating coordination among ministries of health, the Africa CDC, WHO, and implementing partners.[5–7,15–21] Countries with pre-existing multisectoral frameworks rapidly operationalised One Health task forces and laboratory networks during MVD and Ebola virus disease outbreak response measures, thus illustrating the value of sustained pre-emergency institutional preparedness.

The importance of country-level ownership, regional coordination, and strategic transition has been shown during the mpox outbreak. The multicountry mpox outbreak that escalated in 2024 and peaked in early 2025 represented one of Africa's most complex health crises of the decade. The declaration of mpox outbreak as PHECS and Public Health Emergency of International Concern prompted unprecedented regional coordination and political engagement.[1,22–25] After 16 months of response efforts, coordinated by the continental IMST, which brought more than 28 partners under the joint leadership of the Africa CDC and WHO,[3] the emergency status of mpox was lifted, following measurable and sustained reductions in mpox transmission.[4] This substantial progress was attributed to improved detection systems, investment in vaccines, and strengthened laboratory and genomic sequencing capacity, among other interventions.[20,24]

Strong leadership and regional collaboration were notable features of the mpox outbreak response.[20,24] The lifting of the emergency status reflected effective leadership, regional solidarity, and successful international partnerships in controlling the outbreak. Importantly, the transition from emergency mode to long-term country-led management underscores the institutionalisation of outbreak response measures across African public health systems. Surveillance and vaccination strategies now align with national ownership. Despite the gains, mpox remains endemic in several regions, requiring ongoing innovation in local vaccine manufacturing to ensure herd immunity, sustained investments in surveillance and laboratory networks, and strengthened community engagement to prevent resurgence.

Cholera emerged as one of the most important public health threats in Africa in 2025. In response to the escalating cholera situation, 20 African Heads of State and Government from affected countries, led by the African Union Champion on Cholera HE Hakainde Hichilema, President of Zambia, issued a call-to-action mandating the integration of cholera within the IMST coordinated response framework and the establishment of a Continental Cholera Task Force to drive Africa towards cholera elimination by 2030.[26,27] Building on this political momentum, the Africa CDC and WHO jointly launched the Continental Cholera Emergency Preparedness and Response Plan for Africa 1·0 in August 26, 2025,[26] by providing a unified strategic framework to strengthen surveillance; rapid response measures; vaccination; water, sanitation, and hygiene integration; and crossborder coordination across the continent.[21,28,29,30] Leveraging on the mpox response measures, a continental-level IMST was positioned to coordinate multicountry cholera control efforts, strengthen surveillance, accelerate vaccine access, and foster crossborder collaboration. The IMST was integrated with existing continental mpox response structures, showing institutional maturity and resource optimisation. Political commitment was central to the outbreak response.[31]

Surveillance, early detection, and laboratory capacity

Across the outbreaks during 2022–25, early case detection emerged as a decisive factor in determining outbreak size and mortality risk. Mpox responses highlighted the benefits of community health-care workers (CHWs) in the rapid detection and reporting of cases, thereby breaking transmission chains in communities. Integrating event-based surveillance, CHW reporting networks, digital alert systems, and predictive symptom-cluster–based case definitions enhanced timely detection of MVD in Tanzania and Rwanda. Digital tools such as ChainChecker strengthened outbreak analytics and real-time transmission mapping.[23,24,31–37]

In addition, PCR capacity expansion during COVID-19 improved laboratory confirmation in several countries, although considerable disparities persisted between the diagnostic turnaround times of urban and rural areas. Decentralised molecular testing and strengthened sample-transport systems were repeatedly identified as essentials for rapid diagnosis. During the 2025 Sudan virus outbreak in Uganda, mortality-based viral haemorrhagic fever surveillance at Mulago Hospital enabled laboratory confirmation of the index case within 12 h, representing a substantial improvement over the detection delays experienced in 2022. This reduction in diagnostic delay was consistent with findings that each additional day of delay increases the outbreak CFR by approximately 3·8%.

Rwanda, Tanzania, and Ethiopia rapidly contained MVD by institutionalising and implementing innovative surveillance and early detection approaches. Rwanda's handling of its MVD outbreak between September and December, 2024, provided an exemplary model for outbreak response, directly shaping regional approaches in 2025.[5,15,16] After confirming the first MVD case on Sept 27, 2024, Rwanda rapidly scaled up national surveillance, instituted strict monitoring, launched community awareness campaigns, and deployed effective treatment protocols.[5] Through coordinated action, Rwanda successfully halted transmission and declared the outbreak to be over on Dec 20, 2024, with a remarkably low CFR of less than 25%—far below the typical MVD CFR of up to 88%.[5,15,16] Rwanda's robust health-care infrastructure and strong government-led coordination offer valuable lessons on how scientific leadership and preparedness planning can help to prevent the crossborder spread of diseases.[5,15] MVD outbreaks in Tanzania and previous episodes in East Africa informed regional preparedness in 2025. Crossborder coordination was particularly emphasised, as Rwanda's earlier outbreak triggered alerts and strengthened surveillance in neighbouring countries, including Tanzania and South Sudan. These experiences underscored the value of regional early-warning systems and harmonised response protocols, particularly for pathogens with high epidemic potential.

Ethiopia's first-ever MVD outbreak, confirmed on Nov 14, 2025, showed impressive national readiness. The outbreak involved 14 confirmed cases and nine fatalities but was contained within 3 months. Ethiopia declared the outbreak to be over after meeting the WHO requirement of 42 days without new incidences.[38] A government-led response measure involving surveillance, laboratory testing, contact tracing, and case management was instrumental in rapidly containing MVD in Ethiopia. 857 contacts were identified and monitored for 21 days, with rapid deployment of IPC measures that prevented further transmission.[38] Ethiopia's success reflects the effects of investments in laboratory capacity, EOCs, and a trained health workforce—showing that, once established, preparedness infrastructure can substantially alter outbreak trajectories.

The 2025 Ebola outbreak in Bulape and Mweka, Democratic Republic of the Congo, showed the transformative power of digital surveillance tools first operationalised during the mpox response.[10] By rapidly configuring an Ebola virus disease tracker within the national DHIS2 system, response teams could capture details of suspected cases, contacts, laboratory results, vaccination data, and outcomes in a single, real-time platform. Dashboards, SMS alerts, interactive maps, and offline data entry enabled rapid detection, automated notifications, and targeted responses—even in remote, hard-to-reach areas. This digital backbone accelerated laboratory result turnaround, strengthened contact tracing oversight, improved data quality, and supported the timely deployment of response teams, thus directly contributing to rapid containment.[8] The evolution of response measures from mpox outbreak period to Ebola virus disease outbreak period underscores how institutionalising the DHIS2 tracker strengthened outbreak intelligence and operational readiness, reinforcing detect–notify–respond capacities as a cornerstone of epidemic control.

Case management and IPC

Clinical outcomes improved notably in areas where countries mobilised early supportive care, standardised treatment protocols, and investigational medical countermeasures.[13,5,18,39–47]

Although mpox vaccine availability increased through emergency mobilisation mechanisms, the supply remained insufficient, revealing structural inequities in access and the need for prepositioned supplies in endemic regions, based on the evidence from a preprint.[48] MVD clinical responses in Rwanda showed an unusually low CFR of approximately 23%, compared with historical averages of 33–88%, because of rapid deployment of remdesivir, monoclonal antibody MBP091, and intensive care unit-level supportive care.[42–44] Based on the evidence from a preprint, the Sudan virus disease outbreak in 2025 marked a milestone when Uganda launched the Tokomeza rVSV-SUDV vaccine efficacy trial within 4 days of laboratory confirmation—a global first in Sudan virus vaccine deployment.[48] For mpox, improved clinical protocols and standardised supportive care help to shorten illness duration, prevent secondary infections, and enhance

patient recovery, even in resource-constrained settings. Strengthening case management systems by training health-care workers and optimising clinical guidelines equips frontline workers to detect cases early, provide safe patient care, and reduce community spread.[31,36,39,46–48] For cholera, effective case management, especially rapid rehydration therapy, access to oral and intravenous fluids, and strong infection prevention measures, was essential to reducing preventable death rates during outbreaks. Continental response frameworks emphasise expanding treatment points, improving IPC practices, and ensuring coordinated clinical care, all of which considerably lowered cholera fatality rates.[20,21,30,49–52]

Despite progress in clinical outcomes, IPC remains a consistently fragile domain across African health systems. High transmission rates during outbreaks underscore the need for sustained reinforcement of facility-level water, sanitation, and hygiene infrastructure, personal protective equipment supply chains, and safe burial protocols.[19,40,42,52–54] An established best practice emerged from Uganda's ring-IPC strategy during the 2022–23 Sudan virus disease response, involving rapid facility assessments, targeted coaching, and accelerated training of more than 2200 health-care workers. This approach substantially improved IPC scores within 2 weeks and informed improvements during the 2025 response.[18,53,54]

Vaccination

The rapid, strategic, use of vaccines can fundamentally alter epidemic trajectories. During MVD outbreaks in Rwanda, Tanzania, and Ethiopia, the accelerated deployment of candidate and investigational vaccines under emergency protocols illustrated the feasibility and ethical importance of timely access to experimental countermeasures in high-risk settings. Similarly, mpox vaccination campaigns implemented across 16 African countries, including the use of Modified Vaccinia Ankara - Bavarian Nordic (MVA-BN) and live-attenuated freeze-dried vaccinia (LC16m8) in Uganda, Sierra Leone, and the Democratic Republic of the Congo, were essential for containing the epidemic, by complementing surveillance, case management, and community engagement efforts. The rapid field deployment of prepositioned Ebola virus[14] vaccines (Ervebo) in Bulape within 2 weeks of outbreak detection in the Democratic Republic of the Congo further underscored the value of advance stockpiling in endemic settings. These experiences highlight that, in an era of declining official development assistance, prepositioning vaccines in high-risk countries is essential for controlling outbreaks at source, reducing response costs, and minimising transmission. The Africa Pooled Procurement Mechanism could support the prepositioning of vaccines by enhancing the pooled procurement of vaccines and stockpiling them in a centralised warehouse to be quickly deployed when an outbreak occurs in a country.[55]

Although reactive vaccination remains crucial, preventive strategies, including single-dose or two-dose cholera regimens and targeted preventive vaccination for Ebola virus disease and mpox in endemic regions, should be strengthened to build population immunity and stimulate sustainable African vaccine manufacturing ecosystems. Although vaccines are powerful tools for outbreak control, the greatest effect of vaccines lies in prevention; shifting from episodic emergency deployment towards anticipatory, equity-driven vaccination strategies will be central for durable epidemic control.

Community engagement, risk communication, and social dynamics

A consistent lesson across outbreaks was that community trust and culturally grounded communication influence the trajectory of outbreak containment.[56–60]

Mpox response measures, particularly in conflict-affected eastern Democratic Republic of the Congo, highlighted the need for tailored RCCE to address mistrust, stigma, and misinformation.[58] Context-specific messaging, use of local languages, and anti-stigma campaigns were repeatedly recommended. In MVD and cholera response measures, CHWs served as the most trusted communication channel, and locally embedded messaging generated high levels of awareness and satisfaction.[42,49] Sudan virus disease control efforts have revealed persistent barriers to community engagement in dense urban environments, mobility constraints, mistrust of authorities, and stigma, requiring the deployment of trusted intermediaries, including religious leaders, local council structures, and survivors of Ebola virus disease.[57] Without strong RCCE, surveillance, vaccination, and other pillars of the response might not be effective.

Health-system resilience, workforce capacity, One Health integration and partnerships

Effective outbreak response correlates directly with baseline health-system strength.

Countries with extensive field epidemiology and laboratory training programme networks and functioning national laboratory systems responded more effectively to MVD and Ebola virus disease events than those countries with no or inadequate field epidemiology and laboratory training programme.[6,7,16,18,29,33] COVID-19 era investments in digital health, laboratory systems, and data infrastructure have provided substantial benefits across the mpox, MVD, and Ebola virus disease responses; pandemic fatigue and inconsistent adoption continue to impede resilience. Strong partnerships with regional organisations and other partners were consistently identified as crucial enablers of rapid, evidence-driven mobilisation of responses.

Uganda's 2025 Sudan virus outbreak, its eighth since 2000, was declared on Jan 30, 2025, and successfully contained by April 26, 2025. The outbreak involved 14 cases and four deaths, with 534 contacts identified and followed up, depicting the country's well-established outbreak management capacity.[6,7] Strong political leadership, immediate activation of national coordination structures, and the rapid

deployment of response teams ensured early containment. Uganda's response is a testament to the value of long-term investment in health systems capable of swiftly detecting and containing outbreaks in both urban and rural settings.[6,7] The outbreak prompted the launch of a randomised clinical trial of Sudan virus vaccine candidates within 4 days; this remarkable feat illustrated scientific preparedness and institutional agility of Uganda.[61] Additionally, strong community engagement facilitated the management of rumours, behavioural changes, and the rapid adoption of preventive measures.

During the mpox outbreak (2024–25), more than 2000 members of the African Volunteers Health Corps were deployed across the Democratic Republic of the Congo, Uganda, Burundi, and other affected countries, forming multidisciplinary teams that included epidemiologists, IPC specialists, case management clinicians, RCCE experts, and laboratory professionals supporting community health-care workers.[62] This large-scale deployment brought together national and international actors under a coordinated framework, reinforcing country-led response structures while strengthening continental solidarity. By embedding skilled personnel directly within national incident management systems, the African Volunteers Health Corps not only accelerated outbreak containment but also built lasting technical capacity at both national and regional levels, showing the power of integrated, Africa-led surge mechanisms to respond effectively to emerging health threats across the continent.

The need for urgent embedding of One Health principles into routine surveillance and outbreak preparedness was seen in the recent outbreaks.[58,63,64] MVD responses emphasised surveillance of bat populations, environmental monitoring, and transboundary ecosystem assessments, based on data from a preprint and prior literature.[5,15–17,59,65,66] Analyses of mpox outbreaks highlighted the need for integrated human–animal syndromic surveillance at the forest–wildlife interface.[31–33,67,68] Sudan virus disease outbreaks in urban settings underscored the role of human mobility mapping and digital contact-tracing tools in understanding transmission dynamics.[7,18,54]

Operational research as a cornerstone of innovative and equitable outbreak response in Africa

Operational research, research that provides evidence for the optimisation of service delivery, has emerged as a cornerstone of innovative outbreak response in Africa and transformed emergencies into platforms for scientific advancement and lifesaving interventions. The rapid deployment of investigational vaccines for MVD in Ethiopia and Rwanda, candidate vaccines for Sudan virus in Uganda, the landmark Ebola Ça Suffit trial in Guinea that led to the rVSV-ZEBOV vaccine,[69,70] and therapeutic breakthroughs such as mAb114 in the Democratic Republic of the Congo[71] showed that research conducted during outbreaks directly shapes survival outcomes, vaccine policy, and global preparedness.

Research is a pillar of the IMST-led mpox responses and is embedded in the response efforts to guide and inform evidence-based decisions and response. The use of investigational countermeasures, such as vaccines and therapeutics, showed improved response efforts. The sociobehavioural studies embedded within the response effort were instrumental in informing RCCE measures. Nevertheless, delays in ethical clearance and poor access to dedicated, rapidly deployable research financing continue to hinder timely evidence generation. Too often, research is still perceived as an academic exercise rather than a core operational pillar of response, despite clear evidence that it improves clinical management, optimises vaccination strategies, informs modelling and forecasting, and strengthens equity in access to innovation. Embedding operational research within emergency response frameworks, supported by streamlined ethical pathways and sustainable financing, will be essential to ensure that Africa not only responds to outbreaks but continues to lead scientific discovery during crises.

Conclusions and way forward

Currently, epidemic control in Africa depends less on pathogen-specific expertise and more on systemic capabilities, such as rapid surveillance, equitable access to diagnostics and therapeutics, resilient health workforce pipelines, robust IPC practices, community-anchored engagement strategies, and sustained One Health integration.

Available evidence suggests that emergency responses succeed to the extent to which routine health-system investments are maintained between emergencies. Institutionalising these gains, particularly in decentralised laboratory capacity, digital surveillance, community engagement structures, and clinical trial readiness, constitutes a crucial frontier for strengthening Africa's preparedness for future high-threat pathogen outbreaks.

Across all recent major public health emergencies in Africa, several crosscutting innovations and lessons emerged. The institutionalisation of response mechanisms through the IMST, national public health institutes, and EOCs shows the evolution of Africa in outbreak preparedness and response measures. Countries such as Ethiopia, Uganda, and Rwanda showed that sustained investments in laboratories, surveillance, and workforce development translate into rapid containment. Regional solidarity and partner support, often within 24 h of outbreak detection, showed a mature regional health security ecosystem. South–South cooperation was pivotal to increase access to medical countermeasures and exchange key knowledge. National political coordination, from ministerial leadership to presidential task forces, was instrumental in mobilising resources and ensuring community compliance. The response measures to mpox and cholera, in particular, showcased the power of political unity in guiding continental action. Innovative tools and approaches, such as the expansion of genomic surveillance for mpox, the rapid

deployment of investigational vaccines and therapeutics for MVD and Ebola virus disease, the integration of mobility-focused outbreak control measures (eg, monitoring crossborder movement), and improved modelling and early-warning systems for cholera outbreaks, were key entities to outbreak response measures.

The successful control of mpox, MVD, Ebola virus disease, and cholera underscores the value of institutionalising emergency response systems, investing in preparedness, and sustaining political commitment. As Africa continues to face evolving infectious threats shaped by climate change, urbanisation, and global mobility, the lessons highlighted in this Health Policy will serve as a foundation for resilient, self-reliant, and collaborative continental health security architecture that will rely on integration of preparedness and response measures within joint platforms implemented at continental, regional, and national levels. The listed developments point towards a future in which African institutions lead outbreak response measures with reduced dependence on external sources, with national bodies taking the lead, regional bodies facilitating coordination, and global bodies providing support to the response.[72]

These lessons learned, experiences, and best practices must be capitalised, consolidated, and fully translated into sustained preparedness for future outbreaks.

Contributors

ND conceptualised the study, conducted the review, and drafted the original version of the manuscript. YB, MA, KM, MPF, RT, NN, and JK validated and visualised the data, interpreted the findings, and critically reviewed the manuscript. All authors approved the final version of the manuscript.

Declaration of interests

We declare no competing interests.

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