

# Mental health impacts of Marburg virus disease in Rwanda

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## ABSTRACT

The Marburg Virus Disease (MVD) outbreak in Rwanda marks a significant public health challenge, with 64 reported cases and a 23.4% case fatality rate as of October 2024. While the immediate focus remains on containment and clinical management, the mental health implications of the outbreak present an equally critical concern. This paper discusses the psychological toll of MVD in Rwanda, considering the country's historical trauma and existing mental health landscape. Rwanda's experience with the 1994 Genocide against the Tutsi and the COVID-19 pandemic underscores the vulnerability of populations with pre-existing mental health conditions and those exposed to compounding stressors during health crises.

Key high-risk groups identified include healthcare providers, individuals with prior pandemic exposure, those with underlying mental illnesses, and grieving families. The disruption of traditional mourning practices, widespread stigma, and the psychological demands placed on healthcare workers amplify the outbreak's impact on mental well-being. Drawing on lessons from COVID-19, Rwanda leveraged community health workers, telemedicine, and public awareness campaigns to address psychosocial needs. However, the outbreak highlights gaps in mental health resources and the need for tailored interventions.

Recommendations include strengthening mental health support for high-risk groups, integrating psychological services into epidemic responses, and enhancing community resilience through targeted education and support systems. We also emphasize the importance of a holistic response to MVD, addressing both physical and mental health needs to mitigate the long-term impacts of the outbreak.

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## INTRODUCTION

The Marburg virus (MARV) is a highly infectious pathogen that causes Marburg virus disease (MVD), a severe hemorrhagic fever similar to

Ebola [1,2]. It has a high mortality rate, with recent outbreaks in Africa raising concerns over its spread and potential impact [3]. For Rwanda, a country that has endured significant historical trauma, an outbreak of Marburg could amplify

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psychological stressors, exacerbating existing mental health challenges within the population [4,5]. Studies indicate that viral outbreaks like Marburg and Ebola have profound psychological impacts on affected communities [5], particularly in regions with a history of trauma, such as Rwanda [6,7]. The fear of infection, social stigma, and isolation associated with such diseases can worsen mental health conditions, adding to the need for comprehensive psychosocial support during and after outbreaks [8].

The current literature highlights several possible risk factors that affect the development and reactions to health crises, such as Marburg, with pre-existing physical and mental conditions often considered as predicting factors of poor mental health outcomes from direct and indirect exposure to a pandemic, outbreak or any other health crisis [8]. Here, we explored the potential mental health impacts of the Marburg Virus Disease (MVD) outbreak in Rwanda, considering the country's unique historical and social context. Specifically, it seeks to identify high-risk populations, assess the psychological toll on individuals and communities, and evaluate the effectiveness of mental health support systems implemented during the outbreak. We also aimed to provide actionable recommendations for integrating mental health interventions into epidemic responses to mitigate the outbreak's short- and long-term psychological impacts.

## **OUTBREAK OF MARBURG VIRUS DISEASES IN RWANDA**

The initial outbreaks of MVD were recorded simultaneously in Germany and Serbia in 1967, when laboratory personnel was infected after coming into contact with African green monkeys. Since then, MVDs have been reported in 17 countries worldwide [9,10]. On September 27, 2024, Rwanda's Ministry of Health reported the country's first-ever MVD outbreak. By the following day, health authorities had intensified their response efforts, confirming 26 cases and six fatalities [11]. Earlier on Sunday, September 29, Health Minister Dr. Sabin Nsanzimana announced that the government had identified around 300 individuals who had been in contact with those infected, all of whom were undergoing testing to check for the virus. "We have numerous contacts,

and this number is likely to rise as we continue our tracing efforts. To date, nearly 300 people have been identified, and this number may increase due to varying levels of interaction. These individuals may have had casual contact, such as exchanging greetings, or more direct contact, like providing care or being a patient," Minister Nsanzimana stated [12].

As of October 24, 2024, 64 cases of Marburg virus disease had been reported in Rwanda, with 15 deaths [case fatality ratio (CFR) of 23.4%]. Among the first 62 confirmed cases with accessible data, 70% were men, and 48% were aged between 30 and 39. The first two epidemiological weeks of the outbreak saw the most new confirmed cases, with 26 cases recorded in week 39 (23-29 September 2024) and 23 cases recorded in week 40 (30 September-6 October). This was followed by a significant decrease in the subsequent weeks [1].

## **MENTAL HEALTH LANDSCAPE BEFORE MARBURG VIRUS DISEASES**

Rwanda has gone through intense socio-cultural changes and historical events that are inseparable from its current mental health situation [13]. The country experienced an atrocity that took over 1 million people's lives exterminated in just 100 days during the genocide against the Tutsi in 1994 [14]. It is obvious that the impact on Rwandans' mental health because of the magnitude of destruction and loss during the genocide was high. This led to the establishment of a mental health program in 1994 to deal with such resulting consequences.

It should be noted, however, that despite different mental health programs, a recent mental health survey showed the highest prevalence rates of mental disorders of 20.5% (N=19,110) and 52.2% (N=1271) both in the general population and in the sub-sample of survivors of the 1994 genocide against the Tutsi respectively [15–17]. The most prevalent mental disorders were major depressive episodes (12.0%), panic disorder (8.1%), and posttraumatic stress disorder (PTSD) (3-6%) in the general population. In genocide survivors, the major depressive episode was (35.0%) PTSD, and panic disorders (27.9% and 26.8%, respectively). Alcohol use disorder was reported at 1.6% in the general population and 4% among genocide survivors [15,17]. Therefore, although the Marburg Virus Disease did not persist for an extended period

or reach high intensity over a prolonged duration, it is likely that preexisting mental health disorders in Rwanda were exacerbated by the outbreak, leading to additional mental health challenges within a short timeframe.

## **MENTAL HEALTH SUPPORT SYSTEMS IN RWANDA DURING THE MARBURG VIRUS DISEASE OUTBREAK**

Drawing on lessons from the COVID-19 pandemic, Rwanda implemented several proactive measures to manage the Marburg Virus Disease (MVD) outbreak. The COVID-19 pandemic highlighted the importance of a robust healthcare infrastructure, public health education, and mental health support systems, which Rwanda adapted to the Marburg context. Community health workers (CHWs), who were trained during the COVID-19 response to provide basic mental health and psychosocial support, were mobilized to address anxiety and stigma associated with Marburg. Telemedicine platforms and e-mental health services, established during COVID-19 to overcome restrictions and deliver remote mental health support [18], were also expanded to facilitate continuous access to counseling and mental health consultations for individuals affected by MVD. Additionally, Rwanda's experience with public awareness campaigns during COVID-19 helped refine effective communication strategies, utilizing media and community networks to reduce misinformation and encourage preventive measures against Marburg [19]. Lessons in infection control and rapid response to COVID-19 enabled Rwanda to establish quarantine and isolation protocols promptly, minimizing the psychological toll on healthcare workers and patients through structured support and clear guidelines.

## **HIGH-RISK POPULATIONS**

### **Individuals with Prior Experience of the COVID-19 Pandemic**

Individuals in Rwanda with prior experience of the COVID-19 pandemic may be considered high-risk during the MVD outbreak due to the lasting psychological and social impacts of the previous pandemic. Exposure to one public health crisis can often leave individuals more vulnerable to mental health challenges in subsequent crises. The effects

of COVID-19, including anxiety, trauma, and financial strain, have heightened these individuals' susceptibility to stress, fear, and economic hardship, which can be reactivated with the threat of a new health crisis like MVD.

Firstly, psychological distress and compounded trauma are common among individuals who endured high stress levels during COVID-19. Studies indicate that people who faced significant psychological distress from isolation, fear of infection, and disruption of daily routines during COVID-19 may experience compounded trauma when faced with a second outbreak [20]. These individuals are more prone to developing anxiety, depression, and post-traumatic stress responses, especially with the anticipation of repeated restrictions and health risks. For those who experienced grief or loss during the pandemic, the resurgence of health threats with MVD can exacerbate feelings of helplessness and distress.

Furthermore, social isolation and fear of stigmatization remain prominent issues among individuals who experienced stigma during COVID-19. For those who were isolated due to infection or contact tracing, the stigma associated with being a "risk" individual often results in feelings of loneliness and rejection. The MVD outbreak may reignite these fears, as individuals worry about being socially ostracized once again. Stigmatization during health crises has been shown to worsen mental health conditions, particularly in societies like Rwanda's, where community bonds and social acceptance play essential roles in personal well-being [21,22].

### **Individuals with underlying mental illness**

During an epidemic, even when health facilities remain open, and movement is unrestricted, individuals with pre-existing mental health conditions remain at significantly higher risk due to various stressors associated with the health crisis. The widespread fear, uncertainty, and anxiety that accompany an epidemic can exacerbate symptoms in individuals with conditions such as anxiety disorders, depression, and PTSD. These individuals often have heightened sensitivity to crisis-related stressors, which can worsen their symptoms, especially with constant exposure to alarming news and an elevated sense of vulnerability [23].

Although access to healthcare services is available, individuals with mental illness may hesitate to seek in-person support due to fear of exposure to infection in healthcare settings. This reluctance can delay essential treatment and intensify feelings of isolation and helplessness, even without physical distancing measures in place [5]. The psychological toll of an epidemic also includes heightened stigma, as individuals with visible mental health symptoms may be perceived as vulnerable or fragile, discouraging them from seeking help or openly discussing their struggles. Such stigma can lead to self-isolation and exacerbate untreated symptoms, even in an open-access healthcare environment [24].

Furthermore, people with mental illnesses are particularly susceptible to developing severe stress responses due to the uncertainty and disruption that epidemics bring. The heightened sense of threat and concern for personal safety can lead to the worsening of existing conditions, such as increased anxiety, mood swings, and agitation. These stress responses not only impact daily functioning but may also make individuals more vulnerable to other health complications if left unmanaged during the epidemic [20].

### Healthcare providers

Healthcare providers are among the most vulnerable groups during epidemics due to their constant exposure to health risks and the demanding nature of their work. In the case of the MVD outbreak in Rwanda, healthcare workers were among the first to be infected, with multiple reports indicating that they constituted a significant portion of those who tested positive for the virus. This early and high exposure among healthcare providers can be attributed to their close contact with infected patients and the challenges of maintaining strict infection control protocols during an outbreak. Studies indicate that healthcare workers experience high levels of anxiety and stress during such health crises, partly due to concerns about personal safety and the risk of transmitting the virus to their families [8,25]. Many Rwandan healthcare workers who endured psychological strain and exhaustion during the pandemic may now find themselves with diminished resilience as they confront MVD. This heightened vulnerability can lead to increased anxiety, emotional exhaustion, and even physical health declines, impacting their

ability to manage another health crisis effectively. Even with operational healthcare facilities and unrestricted movement, the psychological demands on healthcare providers working amidst an MVD outbreak are profound. The responsibility of treating patients while grappling with the heightened risk of personal infection places significant mental strain on these professionals, impacting their well-being. The repeated exposure to MVD patients, coupled with long working hours and understaffing, leads to high rates of burnout, emotional exhaustion, and compassion fatigue [25,26]. Additionally, healthcare workers who served during previous health crises, such as the COVID-19 pandemic, may carry residual stress, making them particularly susceptible to burnout and mental health deterioration in the face of another epidemic [27].

### People in Grief

Experiencing a profound loss can be one of the hardest periods in a person's life. When a death happens during difficult times, such as the MVD, family and friends may feel heightened distress due to unfamiliar restrictions on funeral gatherings. Traditionally, in Rwanda, it was customary for all relatives, friends, and community members to be present for funeral ceremonies and to offer support to the bereaved family. This communal participation was also expected for joyful occasions [38]. Consequently, it was typical for many people to gather at the home of the deceased, providing comfort to grieving family members and often staying overnight [28]. From a mental health perspective, these cultural practices provide the grieving family with emotional support, reduce feelings of isolation caused by loss, and help protect against complicated grief.

Grieving individuals face unique high-risk factors during health crises, as MVD epidemic-related restrictions can further intensify emotional vulnerabilities. In Rwanda, for example, strict measures limited funeral attendance to only 50 people, and no one was permitted to open the casket to view the deceased [12]. These limitations disrupted traditional mourning practices, which are central to the grieving process in Rwandan culture. The inability to perform customary rituals, such as viewing the body and sharing grief communally, can lead to complicated grief—a

condition involving prolonged distress, intrusive thoughts about the deceased, and difficulty accepting the loss, especially when mourning rituals are restricted [29]. The interruption of these practices can leave individuals feeling a lack of closure, exacerbating mental health issues such as depression and anxiety over time [30]. Additionally, social isolation is a significant risk factor in this context. The restriction on gathering sizes during funerals deprived grieving individuals of the community support that is essential in cultures with strong collective grieving traditions, like Rwanda's. Studies show that the lack of communal support in mourning can leave individuals feeling isolated and unsupported, hindering their emotional healing [31]. Economic instability also presents a high risk; when a family loses a primary earner, the economic impact adds to the emotional burden of grief. In low- and middle-income settings, economic pressure following a loved one's death can compound mental health challenges, as individuals are forced to cope with both emotional and financial loss [28].

Lastly, the stigma surrounding causes of death—particularly when infectious diseases are involved—can further isolate grieving individuals. In Rwanda and similar societies, the stigma associated with fatalities from epidemic-related illnesses may prevent families from receiving social support. Without a supportive community, grieving individuals face a higher likelihood of mental health complications as they struggle to navigate grief in isolation [28,29,32]. These combined factors illustrate the need for mental health support tailored to the unique challenges faced by grieving individuals during health crises.

### **BRIGHT SPOTS AMID THE MARBURG VIRUS DISEASE CRISIS**

During the MVD outbreak in Rwanda, the nation drew upon resilience and preparedness strategies developed through its experiences with the 1994 Genocide against the Tutsi and the COVID-19 pandemic. Rwanda's healthcare infrastructure, rebuilt after the genocide and strengthened during COVID-19, was further fortified to handle the MVD crisis [33]. These experiences taught Rwanda the importance of rapid response, community health integration, and the mental health needs of traumatized populations. This preparedness enabled the country to quickly

implement diagnostic capabilities, isolation units, and safety protocols, reducing the spread of the virus [50]. Additionally, the psychological toll of both the genocide and COVID-19 had already driven Rwanda to prioritize mental health services, which were mobilized to support grieving families, frontline healthcare workers, and those affected by trauma during MVD [34]. This approach reflected a commitment to holistic health care, where mental health was treated as an integral component of epidemic response.

Rwanda's collective resilience and community solidarity—rooted in the need for mutual support post-genocide and strengthened during the COVID-19 pandemic—were also evident during MVD. Although restrictions limited gatherings, families and communities adapted by finding safe ways to stay connected, such as socially distanced visits and virtual gatherings, which helped mitigate isolation [12,34]. Similarly, public health education and hygiene practices promoted during COVID-19, such as frequent handwashing and safe social practices, were reinforced and adapted for the MVD context [34]. The government's swift and proactive response, bolstered by lessons learned from previous crises, included guidelines on safe burial practices and public gatherings [12]. These measures highlight Rwanda's evolving commitment to pandemic preparedness, leveraging both policy improvements and community resilience to navigate health crises effectively and ensure the well-being of its citizens.

### **NEXT STEPS**

The mental health impacts of the MVD outbreak in Rwanda demand robust interventions to alleviate the psychological toll on individuals, families, and communities. Immediate attention should be directed toward implementing public and community mental health initiatives, especially for those unable to access referral hospitals due to financial or logistical barriers. High-risk populations, including individuals with pre-existing mental health conditions and those with prior trauma from the Genocide against the Tutsi and the COVID-19 pandemic, require focused monitoring and support to prevent exacerbation of mental health issues.

Healthcare providers at the frontline of the MVD

response should receive specialized training in stress management techniques and have access to clinical supervision to help them cope with the intense psychological demands of their work. Additionally, individuals with underlying mental health conditions, such as anxiety, depression, and panic disorders, should be provided with practical mental health support to minimize the distress caused by isolation and the fear of infection. Young people facing addiction challenges also need regular professional support to prevent relapses, especially under the heightened stress of the epidemic. By prioritizing these targeted mental health interventions, Rwanda can better address the complex psychological challenges posed by the MVD outbreak, ultimately building a more resilient and supportive society.

## CONCLUSION

The potential mental health impact of Marburg Virus Disease (MVD) in Rwanda is substantial, especially considering the country's unique historical and social context. By prioritizing preventive and supportive measures, Rwanda can mitigate these effects and utilize its strong culture of resilience to aid those impacted. Additionally, mental health screenings should be conducted for individuals suspected or confirmed to have MVD, ensuring their specific mental health needs are accurately assessed and addressed.

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