Containing the Marburg Virus Disease outbreak in Ethiopia, in 2025 – a case study based on a success story

(version 1)

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GENERAL INFORMATION

This case study is the first part of the Association of Schools of Public Health in the European Region (ASPHER) series "Public Health Memory Capsules": Educational materials for the ASPHER community. It is a series of educational materials based on remarkable or highly significant events in public health history, including very recent ones, that offer important lessons for contemporary public health and health care professionals.

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The authors have made every effort to describe the developments presented in this material reliably and accurately. If any inaccuracies occur, they apologize. The authors greatly appreciate comments and feedback, as well as any remarks on improvements or development. Please write these to: Tomasz Bochenek, e-mail: t.bochenek@uj.edu.pl

Foreseen knowledge gained by the students through analyzing this case study

- The role of infectious diseases among current threats and challenges to global public health, as well as the specificity and mechanisms of zoonotic disease spread, including animal-to-human and human-to-human transmission.
- The rules of management in public health emergencies.
- The rules of community-based surveillance and individual-level surveillance.

Foreseen skills gained by the students through analyzing this case study

- Improving preparedness to public health emergencies and large-scale humanitarian crises.
- Rapidly responding to public health threats.

Foreseen competencies (including social) gained by the students through analyzing this case study

- Inter-professional and international collaboration in health care systems and global public health, as well as benefits resulting from implementing such collaborations.
- Enhanced ability to work in interdisciplinary and international teams dealing with contemporary public health emergencies.

PART A.

MATERIAL FOR STUDENTS

Part A contains material that can be used as readings for students of public health or related study directions, before and during the class.

CASE STUDY

On 14 November 2025, a joint press release by the World Health Organization (WHO) and the Ethiopian Ministry of Health confirmed laboratory-verified cases of Marburg Virus Disease (MVD) among patients presenting with suspected viral hemorrhagic fever in Jinka town, with a population of approximately 32,000 inhabitants, in the South Ethiopia Regional State, Ethiopia. This marked the first documented outbreak of MVD in Ethiopia and forms the basis of this real-life case study and real-world teaching case (Africa CDC 2025; GAVI 2025; SPS. A Concentric Company 2025).

It is important to know that MVD is a rare but severe hemorrhagic fever with a high fatality rate of 88–100%. It was initially detected in 1967, following two simultaneous outbreaks in the city of Marburg (giving the disease its name) and Frankfurt, Germany, and another outbreak in Belgrade, Serbia. Subsequently, outbreaks and sporadic cases have been reported in Africa. Currently, there are no approved vaccines or antiviral treatments for MVD. However, early supportive care, including rehydration and symptomatic treatment, improves survival. The WHO classifies MVD as a neglected tropical disease. To learn more about MVD, please use the sources listed in Table 1.

Table 1. Sources of information on the Marburg Virus Disease (MVD).

- Brauburger K, Hume AJ, Mühlberger E, Olejnik J. Forty-five years of Marburg virus research. Viruses. 2012 Oct 1;4(10):1878-927. doi: 10.3390/v4101878. PMID: 23202446; PMCID: PMC3497034 (source: https://pmc.ncbi.nlm.nih.gov/articles/PMC3497034/) - comprehensive overview of our current knowledge about MVD
- CEPI (2024) Marburg – What it is, and what it is not. (source: https://cepi.net/marburg-what-it-is-and-what-it-is-not) – concise information on MVD

- Cleveland Clinic (2023) Marburg Virus Disease (source: https://my.clevelandclinic.org/health/diseases/25097-marburg-virus-disease) – concise information on MVD
- Pisapia R, Fusco F, Scorzolini L et al. (2025) Clinical features of Marburg virus disease: a review of all reported patients since 1967. eClinicalMedicine; 89 (source: https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(25)00514-0/fulltext) – comprehensive synthesis of clinical features of MVD, based on an overview of 722 cases that occurred across 18 outbreaks
- WHO (2025) Marburg virus disease (source: https://www.who.int/news-room/fact-sheets/detail/marburg-virus-disease) – concise information on MVD

A week earlier, on 7 November 2025, the WHO, the Ethiopian Ministry of Health (MoH), the African Centres for Disease Control (CDC), and the United States CDC reported the first index case of Marburg virus. This happened to be the patient who died along with the treating doctors. The secondary transmission occurred among close contacts, including three individuals from the same church community, one police officer residing in the same neighborhood, and one additional unidentified contact. Initial cases were linked to travel, with subsequent human-to-human transmission in the community. Border controls were strengthened to prevent further spread, both intra-regionally and internationally.

Soon after, an Ethiopian researcher from the One Health Team Ethiopia noted the presence of the Marburg virus's natural host, the African fruit bat (*Rousettus aegyptiacus*), in the affected area (Southern Ethiopia). However, there were a few key details regarding the underlying zoonotic spillover from animals to humans and subsequent human-to-human transmission. Most likely, the initial infection occurred through direct, close contact with infected bats or their excreta (urine, feces, saliva) in environments such as mines or caves. To learn more about Egyptian Fruit Bats (Rousettus aegyptiacus), as well as about infectious diseases spread by bats, and also about living safely with bats, you can consult the sources listed in Table 2. Bats can be reservoirs or vectors of viruses that cause not only MVD but also other diseases, including rabies and related lyssaviruses (BSAVA 2025; BCT 2026a; Public Health Scotland 2025; RBE 2026).

Table 2. Sources of information on the Egyptian fruit bats, their habitat, and living safely with bats.

- Herpsafari (2025) Egyptian Fruit Bats (Rousettus aegyptiacus) (source: https://www.youtube.com/watch?v=L1BvRd2BBdY) – short video presenting the Egyptian fruit bats and their habitat
- Gladys Porter Zoo (2020) Egyptian fruit bat (source: https://www.youtube.com/watch?v=pjybm1J_kUg) – short video presenting the Egyptian fruit bats and their habitat
- BCT (2026b) Bats and One Health. The Bat Conservation Trust (source: https://www.bats.org.uk/about-bats/bats-and-disease/relationship-between-bats-and-infectious-diseases) – material on living safely with bats, as well as connections between bats and infectious diseases in humans

The outbreak generated significant local and regional concern because of the risk of spread into neighboring areas with similarly fragile health infrastructure. Local public health officials constructed a temporary 10-bed Marburg transition unit in Arba Minch to manage cases. An atmosphere of intense anxiety and panic prevailed. The Ethiopian region where MVD appeared has long struggled with a combination of sporadic outbreaks of infectious diseases of different etiologies and weak, underfunded healthcare and public health infrastructure. However, unlike previous epidemics, such as COVID-19, cholera, or measles, the current outbreak arrived at a moment when Ethiopia's health sector struggled with an increasingly fragile financing environment characterized by declining donor contributions, audit gaps, procurement backlogs, and mounting pressure from a healthcare workforce fatigued by low wages, high workloads, and years of layered crises (Nardos Y. 2025). Table 3 provides basic information on the Ethiopian health care system.

Table 3. Sources of information on the Ethiopian health care system.

- The Commonwealth Fund (2026) Ethiopia. International Health Care System Profiles (source: https://www.commonwealthfund.org/international-health-policy-center/countries/ethiopia) – Ethiopian health care system's profile

- Kapsule Research Team (2026) Ethiopia's Healthcare System: Structure, Disease Burden, and Digital Health (source: https://kapsuletech.com/blog/ethiopia-healthcare-system/) – overview of Ethiopian health care system

The key factor in coping with this MVD outbreak was appropriate infection prevention and control measures. Despite the prevailing conditions, the Ethiopian Public Health Institute took urgent action to deliver the necessary equipment, including personal protective equipment (PPE), to Arba Minch General Hospital. As part of this successful public health response to disorganization, training in basic psychosocial skills, integrated with MVD case management, was also conducted for 38 healthcare workers from five health facilities in the South Ethiopia Regional State. The MoH deployed Rapid Response Teams (RRT), conducted active surveillance, and carried out door-to-door community screening. Community-based surveillance systems strengthened the identification and reporting of new cases, particularly in high-risk areas. More than 3,800 tests were conducted, along with contact tracing. The RRT helped initiate safe burial practices to contain the spread.

Community education and risk communication played an important role in coping with this MVD outbreak. Multiple channels were used to inform communities about avoiding contact with bats and their excreta. This included social media and traditional media (TV and radio), as well as strong involvement from healthcare workers and community members. Social media and traditional media were also used to run campaigns on safe food storage, avoiding bushmeat, and reporting dead animals. All messages were adapted to local cultural and social contexts, primarily through advocacy with relevant stakeholders and community engagement.

The role of safe animal handling and disposal practices cannot be underestimated in addressing public health crises related to zoonotic diseases, such as the MVD outbreak in Ethiopia. In this case, the relevant guidelines were developed for safe handling and disposal of dead animals. The guidelines recommended using PPE, including gowns, aprons, face masks, gloves, and boots, when handling animal carcasses. These public health actions were coordinated with veterinary and environmental authorities, in particular through a dedicated National Taskforce. The leadership role in preparing guidelines, standard operating procedures (SOPs), training materials, communication tools, as well as documenting the efforts, was held by the Ethiopian Public Health Institute (EPHI).

A vigorous laboratory system also played a central role in the response. More than 3,800 tests were conducted, confirming cases, with nine deaths and five recoveries. This emphasis on real-time, high-quality epidemiological and laboratory data allowed authorities to guide decisions with precision and confidence.

Overall, there were 14 confirmed cases, including nine deaths, with a high Case Fatality Rate (CFR) of 64.3%. Two health workers, a doctor and a nurse, were among the initial fatalities, highlighting occupational vulnerability and gaps in infection prevention and control capacity. All health care facilities were overloaded in coping with the MVD outbreak. The only major health facility serving the area, Jinka General Hospital, has been overwhelmed by a surge in potential cases and in the number of people seeking testing and advice. The facility struggles with a shortage of medical staff, limited case isolation and contact tracing as the outbreak grows, and insufficient staffing, diagnostic capacity, and supplies.

This outbreak sounded the alarm regarding the increasing recurrence of Marburg epidemics worldwide: Uganda, Angola, Ghana, and Equatorial Guinea have experienced outbreaks in recent years. According to the United Nations, deforestation in Ethiopia is a major environmental problem, as the country has the world's highest deforestation rate, losing about 1.4 million hectares of forest each year. Environmental drivers, including rapid deforestation in Ethiopia, may alter human–bat interactions, raising important One Health considerations (ecohubmap 2025). Notably, Rwanda's successful response to the MVD outbreak in 2024 was strengthened by integrated One Health surveillance, accompanied by robust laboratory systems, innovative IPC measures, effective clinical management, and rapid workforce mobilization (Muvunyi 2026).

Nonetheless, Ethiopia's response to MVD was highly successful. This resulted from a collaborative response effort supported by the Africa Centres for Disease Control and Prevention (Africa CDC). The outbreak was managed in line with the WHO Infection Prevention and Control Guideline for Ebola and Marburg Diseases (WHO 2025). As early as November 2025, the Ministry of Health – Ethiopia and the Ethiopian Public Health Institute issued timely and relevant national guidelines for MVD case management and facility readiness (MoH-Ethiopia & EPHIA 2025). On 26 January 2026, the WHO and MoH of Ethiopia declared the end of the MVD outbreak after 42 consecutive days without new cases (WHO 2026; Africa CDC 2026; Herriman R. 2026).

The containment of the spread of MVD in Ethiopia should be interpreted in light of the realities of a low-income, resource-constrained health system. Ethiopia is a low-income country with total health expenditure estimated at around 3% of GDP (World Bank Group 2025). This is well below the levels required to deliver a comprehensive essential health service package. Health financing is fragmented, with high reliance on out-of-pocket payments and donors. These constraints make outbreak response reliant on external financing mechanisms and rapid resource allocation. Therefore, Ethiopia's ability to contain the outbreak reflects the functionality of core health system components even under stress, while also revealing system vulnerabilities such as workforce shortages and uneven distribution of skilled personnel, especially in rural areas. In this context, Ethiopia's success in coping with the MVD outbreak at the turn of 2025 and 2026 is even more meaningful. It can serve as a success story and a good-practice example for the global public health community.

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REFERENCES:

- Africa CDC (2025) Africa CDC Statement on Confirmed Marburg Virus Disease in Jinka, Southern Region, Ethiopia (source: https://africacdc.org/news-item/africa-cdc-statement-on-confirmed-marburg-virus-disease-in-jinka-southern-region-ethiopia/)
- Africa CDC (2026) Ethiopia Ends Marburg Outbreak, Showcasing Rapid Action and Health System Strength (source: https://africacdc.org/news-item/ethiopia-ends-marburg-outbreak-showcasing-rapid-action-and-health-system-strength/)
- Brauburger K, Hume AJ, Mühlberger E, Olejnik J. Forty-five years of Marburg virus research. Viruses. 2012 Oct 1;4(10):1878-927. doi: 10.3390/v4101878. PMID: 23202446; PMCID: PMC3497034 (source: https://pmc.ncbi.nlm.nih.gov/articles/PMC3497034/)
- BCT (2026a) Bats and rabies. Bats and rabies in the UK. The Bat Conservation Trust (source: https://www.bats.org.uk/about-bats/bats-and-disease/bats-and-disease-in-the-uk/bats-and-rabies)

- BSAVA (2025) Rabies and Bat Contact: Information for Veterinary Professionals (source: https://www.bsava.com/article/rabies-and-bat-contact-information-for-veterinary-professionals/)
- ecohubmap (2025) Deforestation in Ethiopia (source: https://www.ecohubmap.com/hot-spot/deforestation-in-ethiopia/4evkklhnigcl6)
- GAVI (2025) Ethiopia battles first-ever Marburg outbreak (source: https://www.gavi.org/vaccineswork/ethiopia-battles-first-ever-marburg-outbreak)
- Herriman R. (2026) Ethiopia Marburg virus outbreak update. Outbreak News Today (source: https://outbreaknewstoday.substack.com/p/ethiopia-marburg-virus-outbreak-update)
- MoH-Ethiopia & EPHIA (2025) Ethiopian National Guidelines for Case Management and facility readiness of Marburg Virus Disease. Ministry of Health – Ethiopia, Ethiopian Public Health Institute (source: https://acrobat.adobe.com/id/urn:aaid:sc:AP:db03e891-f425-4773-b487-e63242e56058/?annonBboxWorkflow=true&viewer!megaVerb=group-edit)
- Muvunyi C, Gashema P, Seruyange E et al. (2026) Rwanda's lessons for strengthening Africa's response to current Marburg virus disease outbreaks. The Lancet Global Health, 2026; 0 (source: https://www.thelancet.com/action/showCitFormats?doi=10.1016%2Fj.langlo.2026.103967&pii=S2214-109X%2826%2900112-9)
- Nardos Y. (2025) Marburg Outbreak Tests a Health System Grappling with Financial Constraints (source: https://www.thereporterethiopia.com/47825/)
- Public Health Scotland (2025) Rabies (source: https://publichealthscotland.scot/population-health/health-protection/infectious-diseases/rabies/overview/)
- RBE (2026) General Information. Rabies - Bulletin – Europe. WHO Collaborating Centre for Rabies Surveillance & Research (https://www.who-rabies-bulletin.org/site-page/general-information)
- SPS. A Concentric Company (2025) Marburg Virus Outbreak: Ethiopia (source: https://www.sps-global.com/global-insights-special-report/ethiopiaoutbreak)
- WHO (2025) Infection prevention and control guideline for Ebola and Marburg diseases. Geneva: World Health Organization. Licence: CC BY-NC-SA 3.0 IGO. (source: https://www.who.int/publications/i/item/9789240111332)
- WHO (2026) Disease Outbreak News. Marburg virus disease - Ethiopia (source: https://www.who.int/emergencies/disease-outbreak-news/item/2026-DON592)
- World Bank Group (2025) Current health expenditure (% of GDP) – Ethiopia (source: https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS?locations=ET)

SUPPLEMENTARY LITERATURE:

- CEPI (2025) Groundbreaking study in Rwanda to unlock new insights into Marburg virus immunity (source: https://cepi.net/groundbreaking-study-rwanda-unlock-new-insights-marburg-virus-immunity)
- GAVI (2025) Preparedness in practice: Rwanda's record-breaking Marburg response (source: https://www.gavi.org/vaccineswork/preparedness-practice-rwandas-record-breaking-marburg-response)
- Kizito K, Adeline K, Baptiste KJ, Anita A, Agnes B, Johnson P, Thierry N. TRACnet: A National Phone-based and Web-based Tool for the Timely Integrated Disease Surveillance and Response in Rwanda. Online J Public Health Inform. 2013 Apr 4;5(1):e202. PMCID: PMC3692857.
- Nsanzimana S et al. (2025) Marburg Virus Disease in Rwanda, 2024 — Public Health and Clinical Responses. N Engl J Med 2025;393:983-993. DOI: 10.1056/NEJMoa2415816 (source: https://www.nejm.org/doi/full/10.1056/NEJMoa2415816)
- WHO (2023) Assessment tool on infection prevention and control minimum requirements for tertiary health care facilities (source: https://www.who.int/publications/i/item/WHO-UHL-IHS-IPC-2023.5)

PART B.

MATERIAL FOR TEACHERS

Part B contains material for teachers, including examples of lessons to be learned from this case study that can be discussed with students, as well as exemplary educational questions to stimulate class discussions.

Depending on the needs, contexts, and existing content of a particular study module in which this case study is used, the aspects highlighted below can be applied to varying degrees, and other lessons or discussion points stemming from successful coping with MVD in Ethiopia can also be applied.

LESSONS LEARNT & DISCUSSION POINTS:

- Rapid and coordinated assessment of the threat, and then response to the emergency leading to the containment of the outbreak, including mobile and permanent laboratory testing. Discuss the involvement of relevant stakeholders in this response.
- Discuss the establishment of isolation and treatment centers, and the role of importation of essential medicines and vaccines.
- Minimum standards for isolation and infection prevention and burial practices advice that need to be provided. Discussion can be conducted on what was done in Ethiopia to control zoonotic and environmental risks, such as restricting access to caves, safe burial, or incineration of dead animals.
- Community education and mobilization and awareness campaigns reached over 20 million households by integrating information on MVD prevention with the national polio campaign. In addition, 4.8 million travelers were screened at entry and exit points, and measures were taken to ensure safe celebrations during public holidays. Discuss the role of anthropological elements in the response, since this was crucial.
- Close monitoring was conducted for 296 individuals who had contact with the last confirmed patients; all completed follow-up protocols and returned home. Discuss the resources needed to implement this.
- There is a need to understand human-bat interactions and local ecosystems to comprehend the background of this MVD outbreak in Ethiopia. Virological testing of bat populations may be needed in such situations.

- Discuss the vulnerability of healthcare workers, dead body handlers, and those who interact with bats in their occupations or lifestyle.
- Identify what summative information best captures this MVD outbreak successfully contained in Ethiopia that is important for public health studies, ASPHER member-organizations, and your own teaching purposes.
- Is MVD a threat to global public health security? How much should schools of public health in your country or region highlight it in their teaching? What competencies could be expected regarding various types of VHFs (viral hemorrhagic fevers)?
- What policies, strategies, and containment measures would you apply if an outbreak occurred in your country? Is the risk of international spread low or high, especially in Europe? Remember that the first MVD outbreak in 1967 was in Europe!
- Scientists warn that climate change, deforestation, and urbanization are steadily destroying the habitats of the fruit bats that harbor diseases like Marburg and Ebola, increasing the risk of outbreaks in the community. What major preventive methods would your students propose?
- Pose the following question to your students. You are a regional health official in a resource-limited setting. Would you prioritize surveillance and contact tracing or strengthening treatment capacity, and why? How would you allocate limited funds between PPE, workforce training, and maintaining routine services?
- Genetic analysis by the Ethiopian Public Health Institute revealed that the virus was of the same strain as the one that had been reported in previous outbreaks in East Africa (see the statement issued by the Africa CDC - the Africa Centres for Disease Control and Prevention: https://africacdc.org/news-item/africa-cdc-statement-on-confirmed-marburg-virus-disease-in-jinka-southern-region-ethiopia/). What implications could that have for designing the outbreak response?
- What were the criteria for the official closing of the MVD outbreak? Discuss these on the class forum.
- Identify and discuss all or some of the twelve essential public health functions that appear in this MVD outbreak case study:

1) Public health surveillance and monitoring: Monitoring and surveillance of population health status, risk, protective and promotive factors, threats to health, and health system performance and service utilization
2) Public health emergency management: Managing public health emergencies for international and national health security
3) Public health stewardship: Establishing effective public health institutional structures, leadership, coordination, accountability, regulations and laws

4) Multisectoral planning, financing and management for public health: Supporting effective and efficient health systems and multisectoral planning, financing and management for public health
5) Health protection: Protecting populations against health threats, for example environmental and occupational hazards and communicable and noncommunicable diseases, including mental health conditions, food insecurity, and chemical and radiation hazards
6) Disease prevention and early detection: Prevention and early detection of communicable and noncommunicable diseases, including mental health conditions and injuries
7) Health promotion: Promoting health and well-being as well as actions to address the wider determinants of health and inequity
8) Community engagement and social participation: Strengthening community engagement, participation and social mobilization for health and well-being
9) Public health workforce development: Developing and maintaining an adequate and competent public health workforce
10) Health service quality and equity: Improving appropriateness, quality and equity in provision of and access to health services
11) Public health research, evaluation and knowledge: Advancing public health research and knowledge development
12) Access to and utilization of health products, supplies, equipment and technologies: Promoting equitable access to and rational use of safe, effective and quality-assured health products, supplies, equipment and technologies

Note on the above: Following expert consultation, the expressions of the 12 EPHFs have been slightly updated to clarify the operational scope of each function, based on the unified list published by WHO in 2021. The order of the list presented here is not significant, as each EPHF is fundamental to effective public health delivery, with prioritization depending on country context. Source: WHO 2024: Application of the essential public health functions: an integrated and comprehensive approach to public health. ISBN 978-92-4-008830-6 (electronic version), ISBN 978-92-4-008831-3 (print version)