MONTHLY SCIENTIFIC REVIEW ON FILOVIRUS

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Situation at a glance

- In January 2025, two filovirus outbreak clusters were reported on the African continent: a Marburg virus disease outbreak in Tanzania and a Sudan virus disease outbreak in Uganda.
- On 1 September 2025, the Democratic Republic of the Congo reported an Ebola virus disease (EVD) outbreak in Kasaï Province, in the southwest of the country. More than 53 cases were confirmed, including at least 45 deaths. Health authorities officially declared the end of the outbreak on 1 December 2025.
- In November 2025, a new Marburg outbreak occurred in Ethiopia, with 13 confirmed cases including 8 deaths as of 10 December 2025.

Scientific articles

This section presents relevant articles published on peer-reviewed scientific journals or pre-print platforms.

2026-04-01

Rethinking Preparedness for Re-emerging Filovirus Diseases in Africa: Integrating Governance, Policy, and Health Security Innovation.

Journal: Int J Infect Dis

Authors: Jean de Dieu Harelimana, Pierre Gashema, Patrick Gad Iradukunda, Hugor Shema, Jean Bosco Munyemana, Radjabu Bigirimana, Emmanuel Edwar Siddig, Claude Mambo Muvunyi

Africa's filovirus outbreaks persist due to governance gaps, policy inertia, and fragile health systems. Proposed solutions include integrating epidemic preparedness into national governance, establishing dedicated authorities, scaling up surveillance, and developing accountability indices to enhance health security.

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2026-04-04

Antiviral activities of ascofuranone and naphthoquinone derivatives against Ebola virus.

Journal: Antiviral Res

Authors: Christelle M Pemba, Yasuteru Sakurai, Yohei Kurosaki, J J Patten, Eri Amalia, Daniel K Inaoka, Robert A Davey, Tomoo Shiba, Kiyoshi Kita, Jiro Yasuda

Ascofuranone (280-12) and naphthoquinone (511-12) derivatives inhibited EBOV infection in vitro by depleting intracellular pyrimidine pools via HsDHODH inhibition, with IC50 values of 0.5 and 0.1 μM, respectively.

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2026-03-13

Glycoprotein-specific transcriptional response contributes to differential vaccine protection against lethal Ebola virus infection.

Journal: Vaccine

Authors: Sheridan B Wagner, Delphine C Malherbe, Ethan G Napier, Andrea Marzi, Ilhem Messaoudi

The study compares transcriptional responses to low-dose VSV-Mak and VSV-Kik vaccines post-EBOV-Makona challenge. VSV-Kik provided complete protection, eliciting rapid antiviral and adaptive immune responses, while VSV-Mak offered partial protection with minimal transcriptional changes, highlighting glycoprotein-specific immune responses despite high EBOV variant homology.

See details

2026-04-02

Nucleoprotein and glycoprotein based serological assays for detection of Marburg virus infections.

Journal: EBioMedicine

Authors: James Kagame, Markus H Kainulainen, Emmanuel Kabalisa, Polina Brangel, Jean Marie Vianney Uwimana, Jessica R Harmon, Nouh Saad Mohamed, Jean Luc Benimana, Ange Umwari, Elif Karaaslan, Agnes Gasengayire, Jennifer Akimana, Herve Murenzi, Claudine Kabageni, Tara Sealy, Bruce Rwagitinywa, Misbah Gashegu, Ayman Ahmed, Shilpi Jain, César G Albariño, Mary J Choi, Amy J Schuh, Tsion Firew, Enock Karekezi, Richard C N Mwesigwa, Albert Tuyishime, Jonathan S Towner, Thierry H Roels, Isabelle Mukagatare, William E Dowling, Joel M Montgomery, Claude Mambo Muvunyi, Christina F Spiropoulou, Jean Claude Semuto Ngabonziza, Éric Bergeron

Two serological assays for Marburg virus disease were developed and validated: a nucleoprotein C-terminal tail (NPct) Mix-and-Read (MR) assay and a recombinant GP1,2ΔTM ELISA. Both assays demonstrated high clinical sensitivity and specificity, with no cross-reactivity wit

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2026-03-31

Confirming ERVEBO Vaccination to Support Ebola Virus Surveillance.

Journal: Emerg Infect Dis

Authors: Elif Karaaslan, Amy Whitesell, Jason Malenfant, William C Carson, Michael Townsend, Kasongo Kayembe Jolie, Enogo Koivogui, Siba Michel Grovogui, Boubacar Diallo, Nouonan Gbamou, Salomon Corvil, Sanaba Boumbaly, Lise Martel, Julie R Sinclair, Alimou Camara, Trevor Shoemaker, Mary J Choi, Joel M Montgomery, Christina F Spiropoulou, Éric Bergeron

A multiplex Luminex assay using sGP and VSV-P-N antigens accurately distinguishes ERVEBO vaccination from natural Ebola infection, with high sensitivity and specificity.

See details

2026-03-18

Limited durability of improvements in infection prevention and control practices following reactive interventions leaves healthcare facilities vulnerable to Ebola virus transmission.

Journal: Clin Infect Dis

Authors: Joy Yang, Kasereka Masumbuko Claude, Emily Kimani, Michael T Hawkes

We assessed impact and durability of an infection prevention and control (IPC) bundle intervention during the Kivu/Ituri Ebolavirus outbreak (2018-2020). IPC scores increased initially, then declined 6 months post-intervention (median 19/36, 30/36, and 28/36, $p<0.0001$). Without sustained IPC practices, health facilities remain vulnerable to nosocomial transmission in future Ebolavirus outbreaks.

See details

2026-03-16

Detection of Marburg Virus Antibodies 25 Years After Outbreak in Watsa, Democratic Republic of the Congo.

Journal: J Infect Dis

Authors: Sydney Merritt, Patrick K Mukadi, Jean Paul Kompany, Megan Halbrook, Kamy Musene, Skylar A Martin, Michael Beya, Merly Tambu, Teri Ann S Wong, Jean Jacques Muyembe-Tamfum, Didine K Kaba, Axel T Lehrer, Jason Kindrachuk, Nicole A Hoff, Placide Mbala Kingebeni, Anne W Rimoin

This study found 4.5% and 1.6% seroreactivity to MARV GP and VP40, respectively, in Watsa/Durba, DRC, 25 years post-outbreak, with 85.7% of MARV GP-reactive individuals showing cross-reactivity to other filoviruses. Continued exposure or undetected cases may persist, highlighting the need for increased surveillance.

See details

2026-03-25

Computational Design of Broad-Spectrum Ebola Antibodies through Framework and Complementarity-Determining Region Synergistic Optimization.

Journal: Research (Wash D C)

Authors: Xinhui Zhang, Xiuying Liu, Jingya Zhou, Peixiang Gao, Shengnan Pan, Xuehua Yang, Huarui Duan, Yi Liao, Fangyuan Zhang, Xuemeng Dong, Junyu Liu, Xiaojing Chi, Wei Yang

Computational-experimental pipeline enhances Ebola antibodies ADI-15878 and ADI-15946, improving neutralization against multiple Ebola species through CDR mutagenesis and FR grafting, with increased binding affinities and buried surface area.

See details

2026-03-12

Development of VP30-targeted nanoparticles using DPS4 fusion peptides for the inhibition of Ebola virus.

Journal: J Nanobiotechnology

Authors: Fang Wu, Yuanwei Huang, Rui Li, Peixuan Gao, Pinpin Lv, Guanxian Wu, Yanhong Ma, Qiang Ding, Jin Zhong, Jiyan Su, Wei Xu

This study develops VP30-targeted nanoparticles using DPS4 fusion peptides to inhibit Ebola virus. Six peptide mutants were engineered, with RPL1 and NPL3 showing strong affinity for VP30 and potent antiviral activity. Structural analyses confirmed these peptides disrupt VP30-NP interactions, offering a novel antiviral strategy.

See details

2026-03-11

Postpartum Persistence of Ebola Virus in Breast Milk.

Journal: N Engl J Med

Authors: Meris Matondo-Kuamfumu, Martin Faye, Grace Kavugho-Hangi, Daniel Mukadi-Bamuleka, François Edidi-Atani, Servet Kimbonza, Eddy Kinganda-Lusamaki, Adrienne Amuri-Aziza, Junior Bulabula-Penge, Amadou Alpha Sall, Jean-Jacques Muyembe-Tamfum, Steve Ahuka-Mundeke, Ousmane Faye, Placide Mbala-Kingebeni

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2026-03-12

Structures of Marburgvirus glycoprotein and its complex with NPC1 receptor.

Journal: Nature

Authors: Gang Ye, Fan Bu, Hailey Turner-Hubbard, Morgan Herbst, Lanying Du, Ge Yang, Bin Liu, Fang Li

MBV GP mediates efficient viral entry. Cryo-EM reveals three states: unbound, NPC1-bound, and nanobody-bound. Glycan cap partially shields receptor site, enabling immune evasion. NPC1 binds uniquely, enhancing affinity and inducing fusion. Nanobody mimics NPC1, offering therapeutic potential.

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Relevant news

This section presents official reports from health agencies, manufacturers and press releases with reliable sources.

Clinical Studies

This section presents relevant clinical trials.

2025-01-27

A Trial to Evaluate Safety, Tolerability, and Immune Responses of an Investigational Monovalent Chimpanzee Adenoviral Vectored Sudan Ebolavirus Vaccine in Healthy Adults

Status: Active not recruiting

Sponsor(s): Sabin Vaccine Institute, Biomedical Advanced Research and Development Authority

A Phase 2, Randomized, Double-blind, Placebo-Controlled Trial to Evaluate Safety, Tolerability, and Immune Responses of an Investigational Monovalent Chimpanzee Adenoviral Vectored Sudan Ebolavirus Vaccine in Healthy Adults

See details

2024-02-09

Study to Evaluate the Recombinant VSV (rVSV)-Marburg Virus Vaccine Candidate (PHV01) in Healthy Adult Subjects

Status: Completed

Sponsor(s): Public Health Vaccines LLC, Biomedical Advanced Research and Development Authority

Phase 1 trial of rVSVΔG-MARV-GP (PHV01) vaccine in healthy adults to assess safety, tolerability, and immunogenicity (Marburg-specific IgG, neutralizing antibodies) via single IM injection with 181-day follow-up.

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2026-02-11

A Phase 1 Randomized, Observer-blind, Placebo-controlled, Dose-escalation Clinical Trial to Evaluate the Safety and Immunogenicity of rVSVΔG-MARV-GP Vaccine in Adults in Good General Health

Status: Recruiting

Sponsor(s): International AIDS Vaccine Initiative, Biomedical Advanced Research and Development Authority

A Phase 1 Randomized, Observer Blind, Placebo-controlled, Dose-escalation and dose expansion Clinical Trial to Evaluate the Safety and Immunogenicity of rVSVΔG-MARV-GP Vaccine in Adults in Good General Health

See details

2025-02-05

Long-Term Neurologic and Neurocognitive Sequelae Following Pediatric Ebola Virus in Liberia

Status: Completed

Sponsor(s): National Institute of Neurological Disorders and Stroke

This study evaluates long-term neurologic and neurocognitive outcomes in pediatric Ebola survivors in Liberia, assessing memory, attention, and mood through exams, cognitive tests, and interviews.

See details

2024-09-18

A Trial to Evaluate Safety, Tolerability, and Immune Responses of an Investigational Monovalent Chimpanzee Adenoviral Vectored Marburg Virus Vaccine in Healthy Adults

Status: Active not recruiting

Sponsor(s): Sabin Vaccine Institute, Biomedical Advanced Research and Development Authority

A Phase 2, Randomized, Double-blind, Placebo-Controlled Trial to Evaluate Safety, Tolerability, and Immune Responses of an Investigational Monovalent Chimpanzee Adenoviral Vectored Marburg Virus Vaccine in Healthy Adults

See details

2025-01-28

EBOla Post-Exposure Prophylaxis

Status: Not yet recruiting

Sponsor(s): ANRS, Emerging Infectious Diseases, Alliance for International Medical Action, Centre de Recherche et de Formation en Infectiologie de Guinée (CERFIG), Medecins Sans Frontieres, Netherlands, Barcelona Institute for Global Health, University of Bordeaux, INSERM UMR S 1136, Agence Nationale de Sécurité Sanitaire de Guinée (ANSS), National Institute for Biomedical Research DRC, Cheikh Anta Diop University, Senegal, PACCI Program, The PANdemic preparedness plaTform for Health and Emerging infectious Response, University of Sierra Leone College of Medicine and Allied Health Sciences, National Public Health Institute of Liberia

EBO-PEP is a phase III trial comparing Ervebo alone (ERV) versus Ervebo plus Inmazeb (ERV+IMZ) for Ebola post-exposure prophylaxis in high-risk, asymptomatic individuals. Participants are randomized 1:1, with follow-up for 60 days, including revaccination at day 56 for th

See details

2024-11-07

Study of Obeldesivir as Postexposure Prophylaxis for Filovirus Diseases Virus Disease

Status: Withdrawn

Sponsor(s): Gilead Sciences (Group)

The goal of this clinical study is to learn more about the study drug, obeldesivir (ODV), and how safe and effective it is preventing Filovirus disease in participants with known or suspected exposure to Filovirus disease. The primary objective is to evaluate the safety and tolerability of ODV for Ebola virus (EBOV), Sudan virus (SUDV), and MARV postexposure prophylaxis (PEP).

See details

Guidelines and practical information

This section lists official manuals of recommendations for clinical practice or public health policy published by leading health organizations.

WHO	**Diagnostic testing for Ebola and Marburg virus diseases (December 2024)**
WHO	**Risk communication and community engagement for Marburg virus disease outbreaks (November 2024)**
WHO	**Ebola and Marburg virus disease epidemics: preparedness, alert, control, and evaluation (August 2024)**
CDC	**Public Health Management of People with Suspected or Confirmed VHF or High-Risk Exposures (May 2024)**
WHO	**Contact Tracing During an Outbreak of Ebola Virus Disease (January 2024)**
WHO	**Country Readiness Strengthening workshop on infection prevention and control for Ebola and Marburg disease outbreaks (December 2023)**
WHO	**Infection prevention and control guideline for Ebola and Marburg disease (August 2023)**
WHO	**Clinical management of patients with viral haemorrhagic fever: A pocket guide for front-line health workers (January 2016)**
WHO	**Case definition recommendations for Ebola or Marburg virus diseases: interim guideline (August 2014)**

Fact sheets

Marburg virus

Phylogeny

The Marburg virus (MARV) belongs to the Filoviridae family and is responsible for Marburg virus disease (MVD). Since its identification in 1967, it has caused 14 outbreaks over 50 years, primarily in Africa. The most severe outbreak occurred in Angola in 2005, with 252 cases and a case fatality rate (CFR) of 90%.

Transmission

MARV is a zoonotic hemorrhagic fever transmitted by Rousettus aegyptiacus fruit bats. Other bat species and certain non-human primates can also be infected, acting as intermediate hosts. Human-to-human transmission occurs through direct contact with bodily fluids from infected individuals or contaminated surfaces. Healthcare workers and close contacts, especially during funeral rites, are at high risk. Vertical transmission has not been demonstrated, but the virus can persist in semen for up to three months after recovery.

Diagnosis

The incubation period ranges from 2 to 21 days. Initial symptoms include fever, headache, and muscle pain, followed by skin rashes around day 7. The disease often leads to rapid multi-organ failure, with death occurring between days 8 and 9. Due to symptom overlap with other viral hemorrhagic fevers like Ebola, clinical diagnosis is challenging and requires confirmation by RT-PCR. IgG testing is used for late-stage confirmation. Samples must be handled in biosafety level 4 (BSL-4) laboratories.

Symptoms

The disease begins with fever, headache, and muscle pain. Around day 7, patients develop skin rashes, followed by multi-organ failure, which frequently leads to death between days 8 and 9. The CFR ranges from 24% to 90%, depending on the quality of supportive care.

Treatment

There is currently no specific antiviral treatment for MVD. Management is primarily supportive. Research is ongoing on several antiviral agents, including galidesivir, favipiravir, and remdesivir, which have shown promising results in animal models. The monoclonal antibody MBP091 demonstrated 100% efficacy in non-human primates and successfully completed a phase 1 clinical trial confirming its safety. The WHO has launched the SOLIDARITY PARTNERS clinical trial to assess these treatments during successive outbreaks.

Vaccination

Currently, 28 vaccine candidates are under development. The MARVAC consortium has prioritized four vaccines, focusing on two main platforms: • rVSV-MARV: The VSVΔG-MARV-GP (Musoke) vaccine, developed since 2005, has shown 100% protection in non-human primates after a single intramuscular injection, with

durable neutralizing antibody responses lasting up to 14 months. The rVSVΔG-MARV-GP (Angola) or PHV01 vaccine has demonstrated rapid protection within three days post-vaccination, making it a potential candidate for post-exposure prophylaxis. • ChAdV: The ChAd3-Marburg vaccine, developed by the Sabin Vaccine Institute, has shown rapid and long-lasting protection in non-human primates and was deployed during the 2024 Marburg outbreak in Rwanda. The ChAdOx1 Marburg vaccine, developed by the Oxford Vaccine Group, entered a phase 1 clinical trial in July 2024 to assess its safety and immunogenicity. The WHO has rapidly implemented a ring vaccination protocol in Tanzania to evaluate these vaccines in an emergency setting.

Zaire Ebola Virus

Phylogeny

Ebola virus is a filovirus belonging to the Filoviridae family and classified under the genus Orthoebolavirus. Six distinct viruses within this genus are known to cause Ebola Virus Disease (EVD): Ebola virus (EBOV), also referred to as the Zaire ebolavirus subtype; Sudan virus (SUDV); Reston virus (RESTV); Taï Forest virus (TAFV); Bundibugyo virus (BDBV); and Bombali virus (BOMV). The first documented outbreaks of Ebola occurred in 1976, with simultaneous epidemics in South Sudan and the Democratic Republic of the Congo.

Transmission

EVD is a zoonotic disease, with fruit bats of the Pteropodidae family considered the most likely natural reservoir. Animal-to-human transmission occurs through contact with infected animals. Human-to-human transmission is primarily via direct contact with blood or bodily fluids of symptomatic or deceased individuals, or indirectly through contaminated fomites. There is also evidence of sexual transmission post-recovery due to viral persistence in semen. The virus has been detected in breast milk as well.

Diagnosis

Diagnosis can be established using various methods, including ELISA assays, antigen-capture detection tests, serum neutralization assays, RT-PCR, electron microscopy, and virus isolation via cell culture. These tests are typically performed on blood samples, or oral fluids when blood collection is not feasible.

Symptoms

EVD is a viral hemorrhagic fever that induces severe and often fatal illness in humans, with a case fatality rate averaging around 50%, ranging from 25% to 90%. The incubation period spans 2 to 21 days. The disease progresses in two phases:The “dry” phase includes symptoms such as fever, fatigue, myalgia, headache, and sore throat. The “wet” phase follows, characterized by vomiting, diarrhea, cutaneous eruptions, and signs of renal and hepatic dysfunction. Complications may include multiorgan failure, internal or external hemorrhage, shock, and spontaneous miscarriage during pregnancy.

Treatment

Two therapeutic agents—Inmazeb and Ebanga—received FDA approval in 2020 for the treatment of EVD in adults, children, neonates born to infected mothers, and pregnant or lactating women.

Vaccination

Two vaccines targeting EBOV have been approved by both the FDA and EMA: Ervebo (rVSV-ZEBOV), currently deployed in outbreak response in the DRC, and Zabdeno/Mvabea (Ad26.ZEBOV/MVA-BN).