MONTHLY SCIENTIFIC REVIEW
ON FILOVIRUS

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Situation at a glance

- In January 2025, two filovirus outbreaks occurred on the African continent: a Marburg virus disease outbreak in Tanzania and a Sudan virus disease outbreak in Uganda.
- On September 1, 2025, the Democratic Republic of the Congo reported an Ebola Virus Disease (EVD) outbreak in Kasai Province, in the southwest of the country.
- As of September 21, 2025, 57 cases (47 confirmed, 10 suspected) including 35 deaths (mortality rate of 61,4%), had been recorded, with initial nosocomial transmission followed by community spread.

Scientific articles

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

2025-08-01

Long-term Sequelae in Ebola Virus Disease Survivors Receiving Anti-Ebola Virus Therapies in the Democratic Republic of the Congo: A Prospective Cohort Study.

Journal: Open Forum Infect Dis

Authors: Angèle Dilu-Keti, Tamara Tovar-Sanchez, Benjamin Cuer, Antoine Nkuba-Ndaye, Daniel Mukadi-Bamuleka, Eric Panzi-Kalunda, Richard Kitenge-Omasumbu, Junior Bulabula-Penge, Fabrice Mambu-Mbika, Placide Mbala-Kingebeni, Ahidjo Ayouba, Jean-Jacques Muyembe-Tamfum, Jean-François Etard, Faustin Chenge, Eric Delaporte, Steve Ahuka-Mundeke, ‘Les Vainqueurs d’Ebola’ study group

Among 750 Ebola survivors treated with advanced therapeutics, 86.7% experienced long-term sequelae, with neurologic issues more frequent in the REGN-EB3 group and musculoskeletal problems linked to age, ZMapp treatment, and acute hemorrhagic symptoms. Female sex, older age, and metabolic comorbidities were associated with recurrent sequelae.

See details

2025-05-18

Potent neutralization of Marburg virus by a vaccine-elicited monoclonal antibody.

Journal: bioRxiv

Authors: Amin Addetia, Lisa Perruzza, Young-Jun Park, Matthew McCallum, Cameron Stewart, Jack T Brown, Alessia Donati, Katja Culap, Alessio Balmelli, Michal Gazi, Ricardo Carrion, Davide Corti, Fabio Benigni, David Veesler

The study engineered a stable Marburg virus (MARV) glycoprotein (GP) trimer and identified a potent, broadly neutralizing human monoclonal antibody, MARV16, effective against MARV and related viruses. MARV16 targets a prefusion-specific epitope, blocking receptor binding and viral entry. The antibody's structure and binding site were elucidated, revealing similarities with other filoviruses and potential for a therapeutic cocktail.

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2025-07-01

Kinetics of hematological and biochemical biomarkers are key tools for monitoring disease progression in Marburg virus-infected patients in Rwanda.

Journal: Sci Rep

Authors: Jean Claude Mugisha, Etienne Kayigi, Noel Gahamanyi, Henri Desire Uwayo, Fidele Umwanankabandi, Pierre Gashema, Edison Rwagasore, David Turatsinze, Menelas Nkeshimana, Misbah Gashegu, Edward Ntagwabira, Lyndah Makayoto, Jean Claude Semuto Ngabonziza, Isabelle Mukagatare, Albert Tuyishime, Nadine Rujeni, Leon Mutesa, Eric Seruyange, Sanctus Musafiri, Theogene Twagirumugabe, Jean de Dieu Harelimana, Claude Mambo Muvunyi

The study retrospectively analyzed 51 MARV-infected patients in Rwanda, finding significantly lower AST, ALT, and creatinine levels, along with increased lymphocytes and platelets, in recovered patients. ALT, AST, and platelets showed strong discriminatory power for different stages of recovery and disease, offering valuable insights for real-time clinical decision-making in MVD management.

See details

2025-05-20

Characterization of Ravn virus viral shedding dynamics in experimentally infected Egyptian rousette bats (Rousettus aegypticus).

Journal: J Virol

Authors: Jessica A Elbert, Amy J Schuh, Brian R Amman, Jonathan C Guito, James C Graziano, Tara K Sealy, Elizabeth W Howerth, Jonathan S Towner

The study experimentally infected 12 Egyptian rousette bats with Ravn virus (RAVV) and monitored viral loads in blood, oral, and rectal swabs over 21 days. Compared to Marburg virus (MARV) infection, RAVV-infected bats showed significantly higher and prolonged rectal viral shedding, prolonged oral shedding, and higher peak viremia. All bats seroconverted by day 21, with notable heterogeneity in viral shedding, suggesting potential differences in transmission dynamics and spillover risks between RAVV and MARV.

See details

2025-07-19

Development of a Novel, Highly Sensitive System for Evaluating Ebola Virus Particle Formation.

Journal: Viruses

Authors: Wakako Furuyama, Miako Sakaguchi, Hanako Ariyoshi, Asuka Nanbo

The study developed a sensitive, biosafety level-2 compatible system using HiBiT luminescence reporter fused to VP40 to evaluate Ebola virus-like particle (VLP) formation. The system detected VP40 release and validated VP40's VLP formation ability, confirming its utility in screening inhibitors targeting late-stage Ebola virus infection.

See details

2025-05-21

Understanding the pathogenesis of uveitis in Ebola virus disease survivors: a study protocol for clinical, molecular virologic, and immunologic characterization.

Journal: medRxiv

Authors: Caleb D Hartley, Susanne Linderman, Tolulope Fashina, Laura Ward, Carolyn Drews-Botsch, Catherine Pratt, Sanjana Kuthyar, Alcides Filho Fernandes, Ye Huang, Charlene Choo, Nam Nguyen, Jessica Carag, Jill Morgan, Colleen S Kraft, Angela Hewlett, David Brett-Major, John S Schieffelin, Robert F Garry, Donald Grant, Grant A Justin, Christopher D Conrady, Justine R Smith, Brent R Hayek, Shiama Balendra, Nisha Acharya, Thuy Doan, Anais Legand, Pierre Formenty, Xiankun Zeng, Ibrahim Conteh, Matthew J Vandy, Lloyd Harrison-Williams, Jalikatu Mustapha, Zikan Koroma, Michael Wiley, Ian Crozier, Jean-Claude Mwanza, Jessica G Shantha, Rafi Ahmed, Steven Yeh, SMILE and EVICT-VR Investigator Study Groups

The study aims to characterize EVD-associated intraocular inflammation (EVD-IOI) in survivors of the 2013-2016 Western African Ebola virus disease (EVD) outbreak. The research will focus on clinical, molecular, virologic, and immunologic aspects, including the detection of Ebola virus (EBOV) in ocular fluids and tissues, and associated immune responses. An observational cohort of EVD survivors and their close contacts will be used to inform clinical decision-making, identify biomarkers, and optimize infection prevention and co

See details

2025-07-25

Identification of potential VP40 inhibitor of Marburg virus through molecular docking, pharmacokinetic analysis and molecular dynamics simulation.

Journal: Sci Rep

Authors: Rohit Das, Anil Bhattarai, Buddhiman Tamang, Nagendra Thakur

Procyanidin, a natural compound, demonstrated superior binding affinity and stability to Marburg virus VP40 protein compared to estradiol benzoate, as shown by molecular docking, dynamics simulations, and ADMET analysis. Procyanidin exhibited a higher binding affinity, lower RMSD, and increased intermolecular hydrogen bonding, suggesting it may be a promising antiviral agent against Marburg virus.

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2025-09-12

Ebola virus' hidden target: virus transmission to and infection of skin.

Journal: J Virol

Authors: Paige T Richards, Anthony M Fleck, Radhika Patel, Maryam Fakhimi, Dana Bohan, Kathleen Geoghegan-Barek, Anna N Honko, Allison E Stolte, Caroline B Plescia, Caitlin O Messingham, Samuel J Connell, Tyler P Crowe, Francoise A Gourronc, Ricardo Carrion, Anthony Griffiths, David K Meyerholz, Aloysius J Klingelhutz, Robert A Davey, Kelly N Messingham, Wendy Maury

Ebola virus (EBOV) infects skin, with viral loads increasing over time in dermal and epidermal cells, including hair follicles. Infection is patchy with minimal inflammation. EBOV can enter and exit the body through skin, with AXL receptor facilitating infection. Topical application of a surrogate virus through abraded skin led to systemic infection, highlighting skin's role in EBOV transmission.

See details

2025-07-22

Monotherapy with antibody 1C3 partially protects Ebola virus-exposed macaques.

Journal: J Virol

Authors: Gabriella Worwa, Carl W Davis, Sarah E Klim, Jacquelyn Turcinovic, Krystle N Agans, Viktoriya Borisevich, Joan B Geisbert, Robert W Cross, Anya Crane, Michael R Holbrook, Mariano Sanchez-Lockhart, Jeffrey R Kugelman, Juan A Patino Galindo, Thomas W Geisbert, Rafi Ahmed, Jens H Kuhn, Erica Ollmann Saphire, Gustavo Palacios, Ian Crozier

The study found that 1C3 monotherapy did not protect macaques from SUDV and only partially protected against EBOV, with rapid emergence of escape mutations. This highlights the need for combination therapy with 1C11 to prevent fatal outcomes and resistance in filovirid diseases.

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2025-09-23

Evaluation of long-term immunity following inoculation with highly diverse orthomarburgvirus isolates in Egyptian rousette bats (Rousettus aegyptiacus).

Journal: J Virol

Authors: Jessica A Elbert, Amy J Schuh, Brian R Amman, Jonathan C Guito, James C Graziano, Tara K Sealy, Elizabeth W Howerth, Jonathan S Towner

Egyptian rousette bats previously infected with MARV alone or with both MARV and KASV showed no viral replication or shedding when challenged with MARV or RAVV eight months later, demonstrating sterilizing immunity and strong secondary immune responses. This suggests that coinfection with these viruses in bats may confer long-term protection against reinfection, potentially mitigating zoonotic spillover risk.

See details

2025-09-01

Modeling Case Burden and Duration of Sudan Ebola Virus Disease Outbreak in Uganda, 2022.

Journal: Emerg Infect Dis

Authors: Donal Bisanzio, Henry Kyobe Bosa, Barnabas Bakamutumaho, Carolyne Nasimiyu, Diana Atwine, Daniel Kyabayinze, Charles Olaro, Robert F Breiman, M Kariuki Njenga, Henry Mwebesa, Jane Ruth Aceng, Richard Reithinger

In 2022, a Sudan Ebola virus outbreak was confirmed in Uganda. Within 1 month of the outbreak's onset, we developed an individual-based modeling platform to estimate the unfolding outbreak's burden of cases and deaths, as well as its duration, using different scenarios. Modeled projections were within the range of observed cases.

See details

2025-09-01

Portable microfluidic-LAMP assay for rapid on-site detection of eight highly pathogenic viruses.

Journal: Anal Chim Acta

Authors: Huan Li, You Nie, Yi Wu, Yuanyuan Cao, Wanying Liu, Rongtao Zhao, Xuesong Feng, Rongzhang Hao

The study introduces a portable microfluidic-LAMP assay for rapid, on-site detection of eight highly pathogenic viruses, including Ebola and Mpox, in resource-limited settings. The assay uses a simple, equipment-free nucleic acid extraction method and a microfluidic chip integrated with LAMP technology, achieving detection within 70 minutes with high sensitivity and specificity. This method offers a practical solution for outbreak control and global surveillance.

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Relevant news

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

2025-09-21

WHO: Ebola situation report DRC/25/02 - 21 September, 2025

Source: AfroWho

As of 21 Sept 2025, the Ebola outbreak in Bulape Health Zone, DRC, totals 57 cases (47 confirmed, 10 probable) with 35 deaths (CFR 61.4%). Most affected: children (0–9 yrs), females (61%), and community workers. Five health workers infected. Cases declining, but active surveillance, vaccination, and community engagement continue.

See details

2025-09-22

Angola Strengthens Preparedness Measures Against the Ebola Virus Disease Outbreak

Source: AfroWho

Following the Ebola outbreak in the DRC, Angola has reinforced surveillance and preparedness, especially in Lunda Norte province. A multidisciplinary team trained 140 frontline workers and engaged over 150 community leaders to boost early detection, risk communication, and cross-border readiness. WHO rates the national risk as high, regional as moderate, and global as low.

See details

2025-09-23

Ebola outbreak in the DRC: why is it so deadly?

Source: Nature

An outbreak of Ebola has been reported in the Democratic Republic of the Congo (DRC), with 47 confirmed cases, including 25 deaths, as of yesterday, according to the World Health Organization (WHO). There are also a probable 10 additional cases and deaths, the WHO says.

See details

2025-09-24

"UNICEF Delivers Vaccines and Provides Critical Support Amid Ebola Outbreak in Kasaï

Source: Unicef

UNICEF delivers 45,000 Ebola vaccine doses to Kasaï, DRC, amid a new outbreak with 47 cases and 25 deaths, including 12 children. Efforts include vaccination, hygiene reinforcement, psychosocial support, and child protection in vulnerable regions. Would you like a comparative overview with WHO’s latest Ebola situation report or a strategic breakdown of UNICEF’s intervention model?

See details

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: Recruiting

Sponsor(s): Albert B. 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

2024-11-07

Study of Obeldesivir as Postexposure Prophylaxis for Filovirus Diseases Virus Disease

Status: Not yet recruiting

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

2025-02-05

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

Status: Recruiting

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

The study aims to assess long-term neurological and neurocognitive effects in individuals who contracted Ebola as children, comparing survivors and close contacts. Participants undergo neurological exams, cognitive tests, and interviews to evaluate symptoms, mood, and daily functioning.

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

The EBO-PEP trial is a phase III, randomized, controlled study comparing Ervebo vaccine alone (ERV) or with Inmazeb (ERV+IMZ) for post-exposure prophylaxis against Ebola. Asymptomatic high-risk individuals, such as those with direct contact with infected individuals or contaminated materials, are monitored daily for 21 days, with additional visits for the ERV+IMZ arm. Follow-up continues in case of hospitalization, with data collection until discharge.

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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

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).