

NEWSLETTER

SPECIAL ISSUE / EBOLA

SEPTEMBER 2025



Message from the Head of the Laboratory

“Dear colleagues and partners,

The month of September was marked by significant scientific progress and by our continued commitment to public health and research in the Democratic Republic of the Congo. On September 3, 2025, our team received and analyzed samples from Kasai Province, leading to the confirmation of the 16th Ebola Virus Disease outbreak.

This confirmation, made possible through our diagnostic capacities, was crucial for the official declaration of the epidemic by the Ministry of Health, following rapid detection and characterization.

We reaffirm our determination to place research and innovation at the service of protecting populations, in close collaboration with our national and international partners.”

— Pr. Placide Mbala Kingebeni

SUMMARY

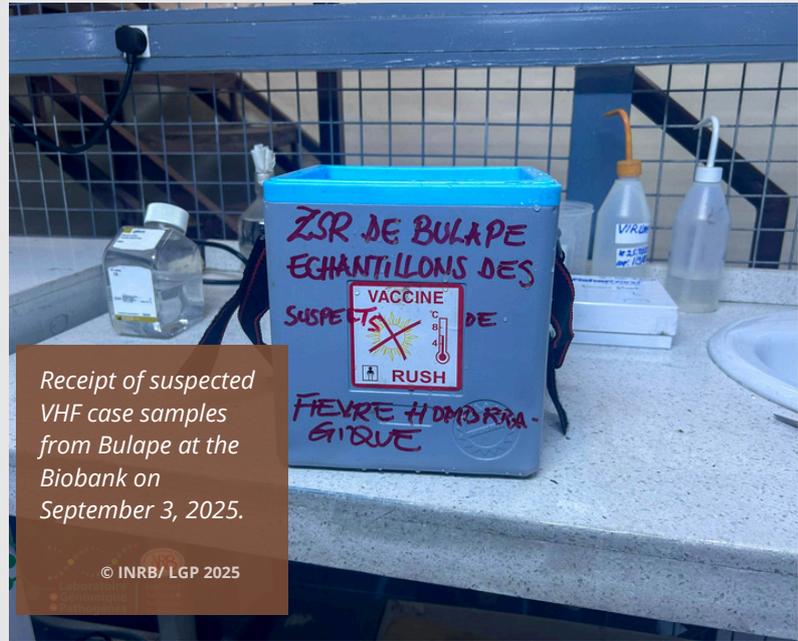
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Alert and Analysis of Suspected VHF Samples from Bulape (Kasai)

On September 3, 2025, the Institut National de Recherche Biomédicale (INRB) received six suspected samples from Kasai Province following an alert of a possible resurgence of Ebola Virus Disease (EVD). Upon their arrival at 3:00 p.m., teams from the Epidemiology and Global Health Department, the Virology Department, and the Pathogen Genomics Laboratory (PGL) worked jointly to confirm the results obtained.

After virus inactivation, analyses began without delay, including PCR testing (GeneXpert, BioFire Multiplex, and Altona) for virus detection. In parallel, whole genome sequencing was initiated to identify the circulating strain responsible for the outbreak.

Work continued throughout the night at the PGL, and by 2:00 a.m., the first genomic sequence had been obtained marking a crucial milestone in the rapid confirmation of positive cases.



Receipt of suspected VHF case samples from Bulape at the Biobank on September 3, 2025.

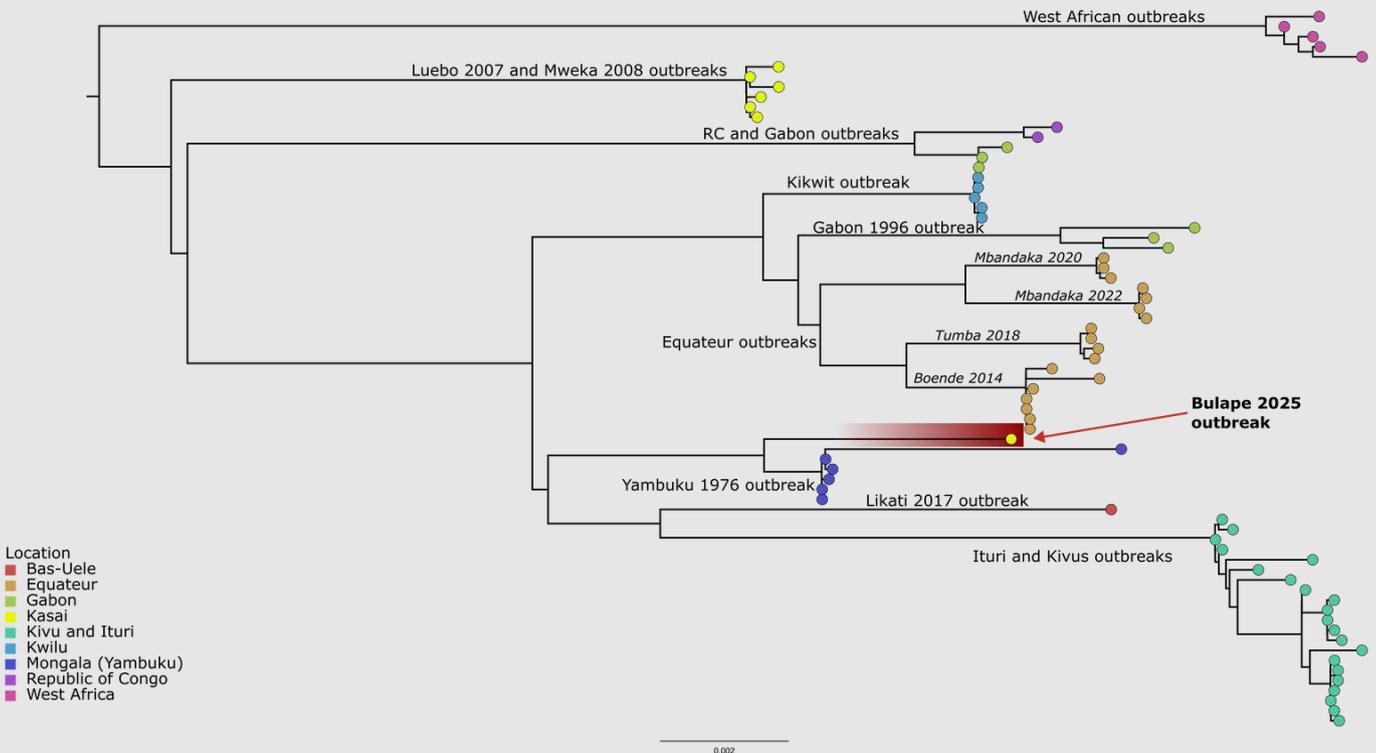
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Ultra-Rapid Ebola Genome Sequencing During the 16th Outbreak in Kasai

On September 4, 2025, the Democratic Republic of the Congo declared its 16th Ebola Virus Disease outbreak following PCR confirmation of the virus from samples collected in the Bulape Health Zone (Kasai). The index case was a 34-year-old pregnant woman, at 34 weeks of gestation, who presented with hemorrhagic fever symptoms and died before the results were available. Six samples were sent to the INRB, tested by PCR and BioFire, and subsequently sequenced. The resulting genome was 99.97% complete and phylogenetically linked to the historical Yambuku-Mayinga strain (1976), suggesting a new zoonotic spillover event unrelated to previous outbreaks in 2007 or 2008–2009.

This rapid genomic characterization was crucial for the Minister of Public Health, Hygiene and Preventive Care official declaration of the outbreak and the prompt implementation of response measures, including the deployment of field laboratories.

A post was published on Virological on September 4, 2025 — less than 24 hours after the confirmation of the outbreak. Read the full post here <https://virological.org/t/the-16th-ebola-virus-disease-outbreak-in-bulape-health-zone-kasai-democratic-republic-of-the-congo-a-new-spillover-event-from-an-unknown-reservoir-host/1003/1>.



DEPLOYMENT OF THE LABORATORY

Laboratory Deployment at the Epicenter of the Outbreak: Installation of Mobile Laboratories in Bulape and Mweka

Following alerts of suspected viral hemorrhagic fever (VHF) cases in Bulape, located in the Mweka territory, the Institut National de Recherche Biomédicale (INRB) deployed a field expert mission at the recommendation of the Ministry of Health, in line with its mandate.

Led by Professor Placide Mbala Kingebeni, Head of the Department of Epidemiology and Global Health, the team overcame extremely challenging road conditions to reach the affected area.

After a stop in Tshikapa, where the team gathered further insight into the health situation, they joined forces with provincial health teams under the leadership of the Provincial Health Division Chief of Kasai and the Provincial Minister of Health, ensuring optimal coordination of the outbreak response in Bulape.



At the Bulape General Referral Hospital, INRB installed the first extension of its mobile laboratory, followed by the deployment of a second mobile lab in Mweka, 35 kilometers from Bulape marking a major milestone in the operationalization of the response strategy.



Launch of Biochemical Analyses in Bulape to Support Patient Care



On September 24, the INRB laboratory established at the Bulape General Referral Hospital (HGR/Bulape) in Kasai Province began conducting biochemical analyses related to the ongoing Ebola outbreak.

These analyses are made possible through the use of the Piccolo device, provided with the support of Africa CDC. This portable biochemical analyzer delivers rapid results using very small blood volumes.

The tool is particularly well suited for field settings, offering high reliability, ease of use, and valuable support for improved patient management. Combined with the expertise of INRB's qualified personnel, the Piccolo represents a major asset in strengthening local capacity, enabling close clinical monitoring, and accelerating the Ebola Virus Disease response.

Installation of a Second Mobile Diagnostic Site in Mweka



On September 29, 2025, the Institut National de Recherche Biomédicale (INRB) established an extension of diagnosis and sequencing laboratory in Mweka, located about 35 km from the Bulape Health Zone — the epicenter of the 16th Ebola Virus Disease (EVD) outbreak.

A specialized team, supported by a mobile laboratory, was deployed to strengthen local molecular diagnostic capacity closer to the affected areas.

This new setup will serve surrounding health areas, ensuring rapid and reliable EVD diagnosis. Its real-time sequencing capability enables dynamic genomic monitoring of circulating strains, facilitating the identification of transmission chains and guiding response strategies.

The integration of this platform in Mweka complements the activities already underway in the Bulape Health Zone and represents a key step toward reducing case confirmation delays while enhancing decentralized genomic surveillance capacity.

Start of Ebola Positive Sample Sequencing in Mweka

On September 30, the Institut National de Recherche Biomédicale (INRB) launched sequencing activities for Ebola-positive samples at its newly established laboratory extension in Mweka.

Through the use of Next-Generation Sequencing (NGS) platforms and the expertise of its technical teams, this facility enables real-time genomic analysis — a major asset for:

- Rapidly characterizing circulating Ebola virus strains,
- Assessing their genetic evolution, and
- Contributing to a deeper understanding of transmission dynamics.



These sequencing activities represent a strategic advancement in genomic surveillance in the DRC and are part of the integrated response efforts to the 16th Ebola virus disease outbreak.



PARTNERSHIPS AND COLLABORATIONS

Logistical and Technical Support from Culmen International and CDC Atlanta



Since the official declaration of the 16th Ebola outbreak by Minister of Public Health, Hygiene and Preventive Care confirming the outbreak in Kasai Province the Institut National de Recherche Biomédicale (INRB) has benefited from strategic support from Culmen International, made possible through funding from CDC Atlanta.

This support aims to strengthen the operational capacity of the laboratories deployed in Mweka and Bulape, which are essential for the rapid confirmation of cases and the implementation of an effective response.



Despite challenging road conditions, the delivery of these critical resources highlights the importance of international collaboration in ensuring continuity of diagnostic activities, bolstering the DRC's preparedness and resilience against epidemic threats, and maintaining biosafety standards in field settings.



As part of this initiative, several key pieces of equipment were provided, including generators to ensure a stable power supply, GeneXpert instruments and BioFire cartridges for PCR testing, personal protective equipment, office materials, and a portable glovebox — enabling safe operations in field environments simulating high-level biosafety laboratory conditions.

WHO Support for the Ebola Response in Bulape and Strengthening of Health Services



The World Health Organization (WHO) has provided major technical and logistical support to the INRB as part of the 16th Ebola virus disease (EVD) outbreak declared in Kasai Province.

This support includes the deployment of laboratory experts to Bulape, the provision of two GeneXpert machines, sequencing reagents, gloveboxes, uninterruptible power supplies, as well as consumables and computers for laboratories in Mweka and Tshikapa.



WHO has also contributed to the decentralization of Ebola diagnostics, laboratory rehabilitation, and the training of twelve technicians in molecular diagnostics, biosafety, and sample management.

On the logistical front, an emergency air bridge was established to transport personnel, equipment, and supplies to the affected areas. WHO also strengthened the cold chain for sample and vaccine preservation and set up regional logistics hubs in Kananga and Tshikapa to facilitate distribution.

These measures have ensured the continuity of response and surveillance activities despite access challenges, thereby consolidating the country's preparedness for epidemic threats.

AFROSCREEN Project Donation to the INRB Laboratory for the Ebola Response



As part of efforts to strengthen genomic surveillance capacity during the Ebola outbreak response, the INRB laboratory received a Mk1D device and flowcells from the Institute of Research for Development (IRD) through the AFROSCREEN project.

This support aims to enhance rapid on-site sequencing activities, enabling more efficient detection and genetic monitoring of the Ebola virus, and thereby contributing to a stronger scientific and operational response.



PARTNERSHIPS AND COLLABORATIONS

Joint support from IMReC, Africa CDC, UCLA, the Uganda National Reference Laboratory, and the University of Bern to strengthen the laboratory capacities in Bulape and Mweka.

The Institut National de Recherche Biomédicale (INRB) received joint support from the International Mpxv Response Consortium (IMReC) and the University of California, Los Angeles (UCLA).

Funded by the Canadian Institutes of Health Research (CIHR) and the International Development Research Centre (IDRC), IMReC works to strengthen the fight against mpox and emerging infectious diseases across Africa. The project is led by Professor Jason Kindrachuk (University of Manitoba, Canada) and Professor Placide Mbala (INRB, DRC), in collaboration with Professor Anne Rimoin (UCLA).



This support has enabled the reinforcement of operational capacities at the Bulape and Mweka laboratories through the provision of specimen collection materials, essential laboratory equipment and consumables, personal protective equipment (PPE), and logistical support for field team mobility.

These efforts have been further strengthened by the University of Bern (Switzerland), which has provided a portable DNA sequencing laboratory as part of the Africa Initiative and the CoRE Genomics for Health in Africa program.



This mobile laboratory enables the Mweka laboratory to perform on-site and real-time sequencing using Oxford Nanopore technologies, which are essential components for outbreak investigation and control.



Additionally, the Uganda National Reference Laboratory, with support from Africa CDC, donated several key instruments to the INRB laboratory. This donation includes a Piccolo machine, associated reagents and cartridges, as well as a glovebox.



Jean-Claude Makangara Cigolo, MD, MD-PhD student

Dr. Jean Claude Makangara Cigolo represents a new wave of African scientists working at the intersection of clinical medicine, biomedical research, and public health preparedness. He serves as a clinical biologist at the Pathogen Genomics Laboratory (INRB, Kinshasa) and is currently pursuing a PhD at the University of Bern, with a focus on viral genomics, bioinformatics, and the epidemiology of emerging infectious diseases.

With over eight years of field and laboratory experience, he has played a critical role in the surveillance and response to Ebola, mpox, and COVID-19 outbreaks—developing sequencing protocols and training scientific teams across Central and East Africa. His work reflects a deep commitment to strengthening Africa's capacity for genomic surveillance and pandemic preparedness.

A prolific researcher, Dr. Makangara has published in leading scientific journals including *The Lancet*, *Nature Medicine*, *Cell*, and *PLOS Global Public Health*. He collaborates with international partners such as CDC Atlanta, Culmen International, and the University of Bern, and currently serves as co-investigator of the IMReC consortium, supporting the response to the mpox epidemic.

Publications :

- A peer-educator driven approach for sampling populations at increased mpox risk in DRC. *PLOS Global Public Health* (2025) → <https://journals.plos.org/globalpublichealth/article?id=10.1371/journal.pgph.0003857>
- A systematic nomenclature for mpox viruses causing outbreaks with sustained human-to-human transmission. *Nature Medicine* (2025) → <https://doi.org/10.1038/s41591-025-03820-6>
- Epidemiology and phylogenomic characterisation of two distinct mpox outbreaks in Kinshasa, DR Congo. *The Lancet* (2025) [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(25\)00294-6/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(25)00294-6/abstract)
- Clade I mpox virus genomic diversity in the Democratic Republic of the Congo, 2018–2024. *Cell* (2025) → [https://www.cell.com/cell/fulltext/S0092-8674\(24\)01199-1?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0092867424011991%3Fshowall%3Dtrue](https://www.cell.com/cell/fulltext/S0092-8674(24)01199-1?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0092867424011991%3Fshowall%3Dtrue)

SEPTEMBER IN PICTURES



Inactivation and secure processing of Viral Hemorrhagic Fever (VHF) samples prior to analysis



Visit of the African Academy of Sciences (AAS) delegation to the Pathogen Genomics Laboratory



Deployment of a mobile laboratory at the INRB's satellite site in Mweka



The Pathogen Genomics Laboratory's team after sequencing the first Ebola-positive samples from Bulape.



Strategic deployment of laboratory equipment to Bulape



Launch of GeneXpert analysis in Bulape



Operationalization of Piccolo analyzers in Bulape to conduct the first biochemical analyses of Ebola-positive samples.



Commencement of diagnostic activities in Mweka



First biochemical tests successfully conducted in Bulape on confirmed Ebola cases, using the newly deployed equipment.



Receipt of laboratory support equipment from Uganda, through the assistance of Africa CDC and the Uganda National Reference Laboratory.

OUR PARTNERS



SCIENTIFIC PUBLICATIONS

1. Phylogenetic analysis of initial genomes from Kasai EBOV outbreak, 8 September 2025. *Virological* (Septembre 2025)- <https://virological.org/t/phylogenetic-analysis-of-initial-genomes-from-kasai-ebov-outbreak-8-september-2025/1004>
2. The 16th Ebola Virus Disease Outbreak in Bulape Health Zone, Kasai, Democratic Republic of the Congo: A new spillover event from an unknown reservoir host. *Virological* (Septembre 2025)- <https://virological.org/t/the-16th-ebola-virus-disease-outbreak-in-bulape-health-zone-kasai-democratic-republic-of-the-congo-a-new-spillover-event-from-an-unknown-reservoir-host/1003/1>

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