NEWSLETTER

OCTOBER 2025 *009/2025*

Message from the Head of the Laboratory

"Dear colleagues and partners,

This edition of the Pathogen Genomics Laboratory (LGP) newsletter at INRB highlights our recent progress in genomic surveillance and epidemic response. Our teams remain actively engaged in the field as part of the Ebola outbreak response, while also strengthening environmental surveillance through the wastewater project and the integration of innovative tools such as ChainChecker, developed by the Centers for Disease Control and Prevention (CDC).

These efforts reflect our ongoing commitment to improving early detection and rapid response to infectious threats. I commend our teams for their dedication and thank our partners for their continued support of research and public health in the Democratic Republic of Congo."

Aziza Amuri Adrienne

SUMMARY

Participation in the International Conference on Public Health in Africa (CPHIA 2025)

The city of Durban, South Africa, hosted the 4th International Conference on Public Health in Africa (CPHIA 2025) from October 22 to 25, 2025 — a major event organized by the Africa Centres for Disease Control and Prevention (Africa CDC).

This annual gathering brings together key public health stakeholders, researchers, policymakers, and technical partners to discuss the continent's health priorities and strengthen African scientific collaboration.

Professor Placide Mbala, Head of the Directorate of Epidemiology and Global Health and Director of the Clinical Research Center at the National Institute of Biomedical Research (INRB), participated as co-chair and speaker.

On this occasion, he presented the Outstanding Scientist in Public Health Award to Professor Olive Shisana, an iconic figure in South African and global public health, in recognition of her remarkable contributions to research, health policy, and the promotion of health equity.
Professor Mbala's participation in this continental forum underscores the growing influence of Congolese scientific leadership on both the African and international stage.

Training of Laboratory Providers in Mweka and Tshikapa on Ebola Virus Disease (EVD) Diagnosis

As part of the response to the recently declared Ebola outbreak in Bulape, the National Institute of Biomedical Research (INRB), through its Pathogen Genomics Laboratory (LGP) and in collaboration with WHO DRC, organized two technical training sessions in Mweka and Tshikapa.

The first session, held from October 1–2, 2025, brought together six laboratory providers from the Mweka Health Zone.
The second session, conducted in Tshikapa on October 5–6, 2025, included seven participants, among them two laboratory technicians and five medical biologists, who took part in a similar program tailored to the specific needs of their health zone.

These trainings, which combined both theoretical and practical components, aimed to strengthen the capacity of local laboratory staff on the following key topics:

- Biosafety and biosecurity: good infection prevention and control (IPC) practices suitable for laboratories handling highly pathogenic agents;
- Sample collection and transport: safe collection of blood and oropharyngeal samples and secure sample transport;
- Ebola virus disease diagnosis: principles and molecular detection techniques for rapid and reliable diagnosis;
- Practical sessions: virus inactivation under a biosafety cabinet, preparation of Ebola virus cartridges, and PCR testing on GeneXpert.

These initiatives form part of the national strategy to strengthen genomic surveillance and early diagnosis, both of which are essential for effectively containing epidemic outbreaks.

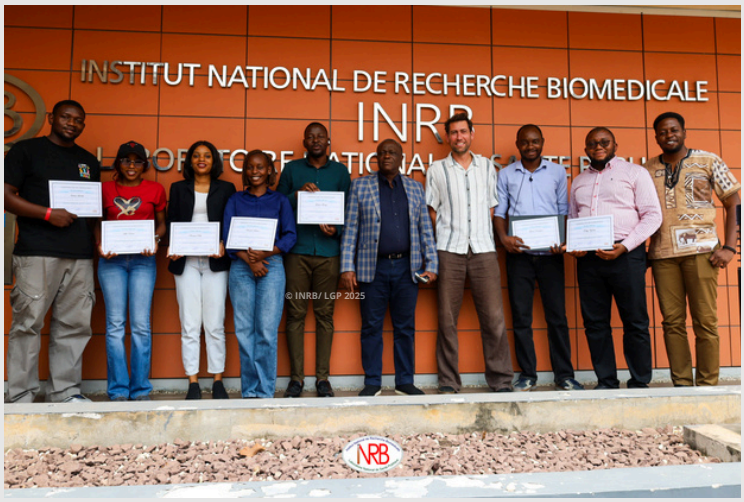
Strengthening Genomic Analysis Capacity: INRB Trained on the Use of ChainChecker Tool Developed by CDC Atlanta

The Centers for Disease Control and Prevention (CDC) recently developed ChainChecker, an innovative application designed to build and validate transmission chains during outbreaks. This tool integrates epidemiological and genomic data, providing a more comprehensive and accurate analysis of transmission dynamics.

In this context, the National Institute of Biomedical Research (INRB) benefited from a hands-on training delivered by Culmen International, a partner of CDC Atlanta, focused on using the tool with a demonstration dataset.

As a result of this training, INRB is now equipped to apply the tool to real data from the 2025 Ebola outbreak in Bulape, thereby enhancing the analysis and understanding of transmission chains and contributing to a more integrated and responsive epidemiological surveillance system.

Participation in the Microbiome Analysis Workshop Organized by IMT Antwerp



A three-day workshop organized by IMT Antwerp was held at the National Institute of Biomedical Research (INRB) from October 8 to 10, 2025, bringing together 11 participants to explore microbiome analysis.

The training combined theoretical, practical, and bioinformatics components, covering topics such as an introduction to microbiomes, use of command-line tools under Linux, processing of 16S rRNA gene sequencing data with the QIIME 2 platform (including quality control, denoising with DADA2, taxonomic assignment with SILVA, and microbial diversity analyses), as well as statistical analysis and data visualization in R using specialized packages such as phyloseq, vegan, and ggplot2.

This workshop enabled participants to gain a comprehensive understanding of the microbiome analysis pipeline, from data generation to biological and ecological interpretation.

Mpox Virus Surveillance in Wastewater: The Wastewater Project Strengthens Epidemiological Monitoring

Implemented by the Pathogen Genomics Laboratory (LGP) of the National Institute of Biomedical Research (INRB), the wastewater project aims to use wastewater as an epidemiological indicator for the early detection of emerging viruses, particularly the mpox virus. This approach, which complements clinical surveillance, enables the early identification of viral circulation signals within communities, including in areas without confirmed cases.

Between October 1 and 31, 2025, a total of 82 samples were collected from 20 sites located in Mbandaka (36), Kinshasa (34), and Lubumbashi (12). Of these, 76 samples were processed for analysis, while 6 remain under treatment.
Launched in July 2024 in Mbandaka with a pilot site, the wastewater project has progressively expanded its network to Goma, Bukavu, and Kinshasa in 2024, and later to Mbandaka, Lubumbashi, and Kolwezi in 2025 — bringing the total to 22 active surveillance sites.

This initiative significantly contributes to strengthening national public health monitoring and response capacities in the Democratic Republic of Congo.

OCTOBER IN PICTURES

Analysis of suspected Ebola samples on GeneXpert in Mweka

Inactivation and processing of suspected Viral Hemorrhagic Fever (VHF) samples prior to analysis in Mweka

INRB team and collaborators working in the laboratory set up at Bulape General Reference Hospital (HGR Bulape)

Certificate handover to participants of the microbiome analysis training organized by IMT in Kinshasa

Meeting between the Pathogen Genomics Laboratory team and the CDC Atlanta team in Mweka

Visit of the Culmen International team to Mweka

Analysis of Mpox wastewater samples from the Wastewater Project in Kinshasa

Participants of the training on Ebola Virus Disease (EVD) diagnosis in Mweka

OUR PARTNERS

Publications: From January 1 to October 29, 2025

1. Field Evaluation of Mobile Molecular Differential Tests in DRC and Nigeria. OFID (sept 2025) -https://academic.oup.com/ofid/article/12/10/ofaf630/8277590?login=false
2. Serologic evidence of crimean-congo hemorrhagic fever virus exposure among livestock and farmers in the Democratic Republic of the Congo. PLOS (Oct 2025) - https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0013648
3. 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
4. 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 .
5. A peer-educator driven approach for sampling populations at increased mpox risk in the Democratic Republic of the Congo: Implications for surveillance and response – PLOS (Aout 2025) https://journals.plos.org/globalpublichealth/article?id=10.1371/journal.pgph.0003857
6. ·Emergence of Clade Ib Monkeypox Virus—Current State of Evidence-Emergence Infectious Diseases (Aout 2025)- https://wwwnc.cdc.gov/eid/article/31/8/24-1551_article
7. ·Long-term Sequelae in Ebola Virus Disease Survivors Receiving Anti-Ebola Virus Therapies in the Democratic Republic of the Congo: A Prospective Cohort Study- OFID (Juillet 2025) - https://academic.oup.com/ofid/article/12/8/ofaf436/8219544?login=false#google_vignette
8. A systematic nomenclature for mpox viruses causing outbreaks with sustained human-to-human transmission-NatureMedecine (Juillet 2025) https://www.nature.com/articles/s41591-025-03820-6
9. Epidemiology and phylogenomic characterisation of two distinct mpox outbreaks in Kinshasa, DR Congo, involving a new subclade Ia lineage: a retrospective, observational study- THE LANCET (Juillet 2025) https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(25)00294-6/abstract
10. Three Cases of Vertical Transmission of Clade Ib Mpox Virus. N Engl J Med (Juin 2025)-https://www.nejm.org/doi/10.1056/NEJMc2503347
11. Clade Ia Monkeypox Virus Linked to Sexual Transmission, Democratic Republic of the Congo, August 2024-https://wwwnc.cdc.gov/eid/article/31/5/24-1690_article
12. Tecovirimat for Clade I MPXV Infection in the Democratic Republic of Congo-NEJM6 (Avril 2025)- https://www.nejm.org/doi/10.1056/NEJMoa2412439
13. Clinical presentation and epidemiological assessment of confirmed human mpox cases in DR Congo: a surveillance-based observational study- The Lancet (Avril 2025). https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(25)00152-7/abstract
14. Comparison of EBOV GP IgG Antibody Reactivity: Results from Two Immunoassays in the Democratic Republic of the Congo- Journal of Virological Methods (avril 2025) https://www.sciencedirect.com/science/article/abs/pii/S0166093425000473?via%3Dihub
15. Public health priorities for mpox clade Ib in pregnant, breastfeeding, and paediatric populations in DR Congo- The Lancet (Avril 2025)- https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(25)00152-5/abstract
16. Epidemiological and clinical features of mpox during the clade Ib outbreak in South Kivu, Democratic Republic of the Congo: a prospective cohort study - The Lancet (2025) https://www.sciencedirect.com/science/article/abs/pii/S0140673625000479
17. Clade I mpox virus genomic diversity in the Democratic Republic of the Congo, 2018–2024: Predominance of zoonotic transmission - Cell (mars 2025)- https://www.cell.com/cell/fulltext/S0092-8674(24)01199-1?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0092867424011991%3Fshowall%3Dtrue
18. Establishment of a regional Mpox surveillance network in Central Africa: shared experiences in an endemic region - Global Health Research and Policy (Mars 2025) https://ghrp.biomedcentral.com/articles/10.1186/s41256-025-00408-y
19. Suspected and confirmed mpox cases in DR Congo: a retrospective analysis of national epidemiological and laboratory surveillance data, 2010–23 - The Lancet (février 2025)https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(24)02669-2/abstract
20. Evolving Epidemiology of Mpox in Africa in 2024 - The New England Journal of Medicine (février 2025)https://www.nejm.org/doi/full/10.1056/NEJMoa2411368
21. Concurrent outbreaks of mpox in Africa—an update - The Lancet (janvier 2025) https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(24)02353-5/abstract

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