



Building Collective Resilience through integration of One Health Mobile Laboratories

This white paper highlights key insights and practical recommendations to strengthen preparedness and response.

What You Should Know

Imagine a returning traveller carrying a haemorrhagic fever virus, or an unexpected mosquito-borne outbreak in Southern Europe. Such a scenario is no longer hypothetical: climate change, globalization, and expanding vector habitats are driving emerging pathogens into new territories. Europe has already seen local transmission of CCHFV, WNV, and RVF, alongside imported cases of Dengue, Ebola, and Marburg viruses ([ECDC Surveillance Atlas, 2023](#)).

Yet despite existing laboratory infrastructure, response times remain slow, particularly in remote or under-resourced areas, leaving critical gaps in epidemic preparedness. According to project findings:

- Only 16% of mobile laboratories meet BSL-3/4 standards.
- 88% focus solely on human diagnostics.
- Fewer than 12% operate under accredited quality systems.

Why One Health Matters

Human, animal, and environmental health are intricately linked. Ignoring zoonotic reservoirs risks maintaining pathogen transmission chains. MOBILISE addresses this by integrating decentralized diagnostics, real-time mapping of transmission pathways, and rapid local response.



One Health offers an integrated approach that considers interconnection between human, animal, and environmental health to prevent and manage diseases through cross-sectoral efforts.

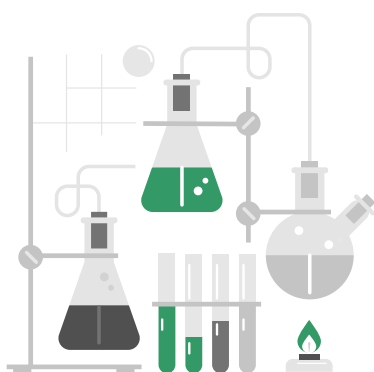
By integrating cutting-edge science, operational readiness, and sustainability, MOBILISE offers a novel approach to enhancing epidemic preparedness.

Key Features of Mobile Labs

Feature	Description
Integrated diagnostics	Simultaneous analysis of human, animal, and environmental samples
Laboratory capabilities	Molecular assays, serology, microbiology, rapid point-of-care tests for risk group 3 and 4 pathogens, on-site whole genome sequencing

Sustainable deployment

Powered by solar energy, and prioritizing sustainable consumables to reduce environmental impact while enabling rapid field deployment



Recommendations for Science

1. **Advance Genomic Epidemiology** - Deploy mobile sequencing platforms to detect emerging pathogens and map transmission networks in real time.
2. **Standardize Biosafety & Quality Standards** - Implement harmonized SOPs and workflows for safe, high-quality mobile lab operations.
3. **Promote Cross-Sector Collaboration** in Europe and beyond - Strengthen One Health networks across human health, veterinary, and environmental research communities.
4. **Support Sustainable Deployment** - Develop energy-efficient, scalable mobile laboratories ready for rapid deployment in Europe and Africa.

Advisory Board Reflections

Bringing together expertise from veterinary medicine, human health, biosafety, and life sciences, our Advisory Board provides multidimensional insights that sharpen MOBILISE's relevance and impact. This white paper mobilises two of these voices, each addressing a critical aspect of epidemic preparedness: the integration of mobile laboratories into European surveillance systems and the assurance of biosafety in high-containment field operations.



Theresa Enkirch – European Centre for Disease Prevention and Control (ECDC)



"Mobile laboratories such as MOBILISE can potentially add capacity and strengthen EU surveillance by bringing rapid, field-based diagnostic capacity directly to outbreak sites, reducing delays between detection and confirmation."

"Their mobility can allow for deployment to hotspots, border areas, or regions with limited laboratory infrastructure, ensuring that samples from humans, animals, and the environment are tested quickly and safely. This complementary role might increase early-warning capabilities by detecting emerging zoonotic pathogens at their source, improving cross-border preparedness, and reducing delays in response. Mobile laboratories could potentially also provide surge capacity during large-scale events, helping to relieve pressure on national laboratories."

Dionysis Vourtsis – President of the Hellenic Biosafety Society



"Mobile BSL-3/4 laboratories are essential for rapid outbreak response, enabling advanced testing to reach remote and resource-limited areas without permanent high-containment facilities."

"Their deployment, however, introduces critical biosafety and logistical challenges - including airflow disruption, utility demands, and workspace limitations - while handling high-risk pathogens, which requires site-specific verification, validated workflows, and strict adherence to biosafety guidelines. Effective operation depends on innovation, strong management, harmonized standards, and a well-trained workforce, ensuring safe diagnostics, protecting communities, and strengthening global epidemic preparedness."



Conclusion

MOBILISE shows that mobile One Health laboratories - combining advanced diagnostics, biosafety by design, and sustainable deployment - can transform epidemic preparedness. By fostering cross-disciplinary collaboration and cross-border coordination, they enable societies to anticipate and respond to emerging pathogens before they escalate. Embedding biosafety and surveillance integration as complementary foundations ensures these laboratories become trusted, high-impact assets for resilient outbreak response.

Partners powering MOBILISE:

BERNHARD-NOCHT-INSTITUT FUER TROPENMEDIZIN (BNITM), Germany

FRIEDRICH LOEFFLER INSTITUT - BUNDESFORSCHUNGSINSTITUT FUER TIERGESUNDHEIT (FLI), Germany

AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH (AIT), Austria

AUSTRIAN AGENCY FOR HEALTH AND FOOD SAFETY GMBH (AGES), Austria

MDSC SYSTEMS OU (MDSC), Estonia

NATIONAL PUBLIC HEALTH ORGANISATION (NPHO), Greece

RED CROSS ROMANIA (SNCRR-S5), Romania

BEIA CONSULT INTERNATIONAL SRL (BEIA), Romania

EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS (EXUS), Greece



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