

# Integration of a One Health Laboratory in Austria for Rapid Outbreak Management

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## Background

Due to climate change, European countries are facing changes in the spatial and temporal distribution of arthropods such as mosquitoes and ticks, which can serve as vectors for pathogens including Crimean-Congo haemorrhagic fever virus (CCHFV), West Nile fever virus (WNV), Rift Valley fever virus and dengue fever virus. The spread of these viruses increases the risk of disease incidences, thereby raising concerns for public health. Essential control measures, such as monitoring zoonoses and their outbreaks, are critical to protecting human and animal populations. The One Health concept plays a crucial role in examining samples from humans, animals, and the environment to enable a rapid response to pandemic and epidemic situations. Novel mobile One Health laboratory solutions (such as the MOBILISE laboratory, <https://mobilise-lab.eu>), that can receive and analyse human, veterinary and environmental samples at outbreak sites, could play an important role in arboviral diagnostics in the future.

## Methods and Results

Reporting notifiable diseases to the authorities is an essential system for controlling and combating diseases. As part of the MOBILISE project (ID: 101073982), the workflow for West Nile virus (WNV) and Crimean-Congo haemorrhagic fever (CCHFV) in Austria were investigated to identify gaps where the MOBILISE mobile laboratory with its Decision Support System (DSS) and Communication Platform (CP) functions could improve disease control measures [1][2].

### MOBILISE Strengthens Disease Response

To assess how the MOBILISE laboratory, with its additional functions (Decision Support System and Communication Platform), can enhance disease control in Austria, we developed how a CCHFV-positive patient could progress through the official outbreak response workflow. This process begins with the patient's hospital admission, notification in national databases, and the official sample analysis at the National Reference Centre (NRC). The mobile laboratory could provide support by collecting additional samples in various health contexts, such as from contact persons, animals, and ticks. The mobile laboratory will work closely with the Ministry, local authorities, and AGES, all of whom play key roles in disease control and forwarding disease notifications at the international level (Figure 1).

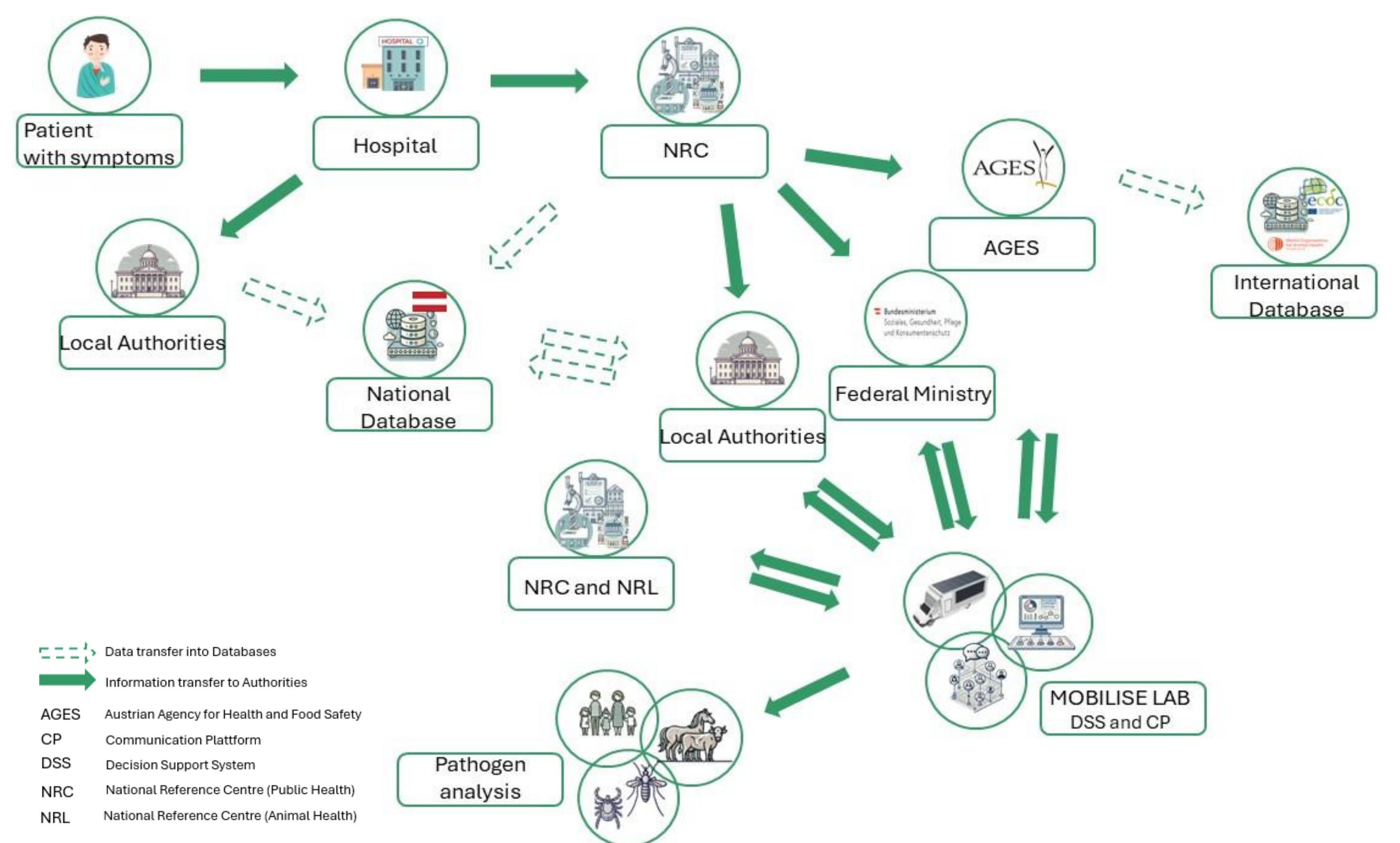


Figure 1: Austrian CCHFV case workflow to evaluate potential improvements with the MOBILISE Mobile Laboratory

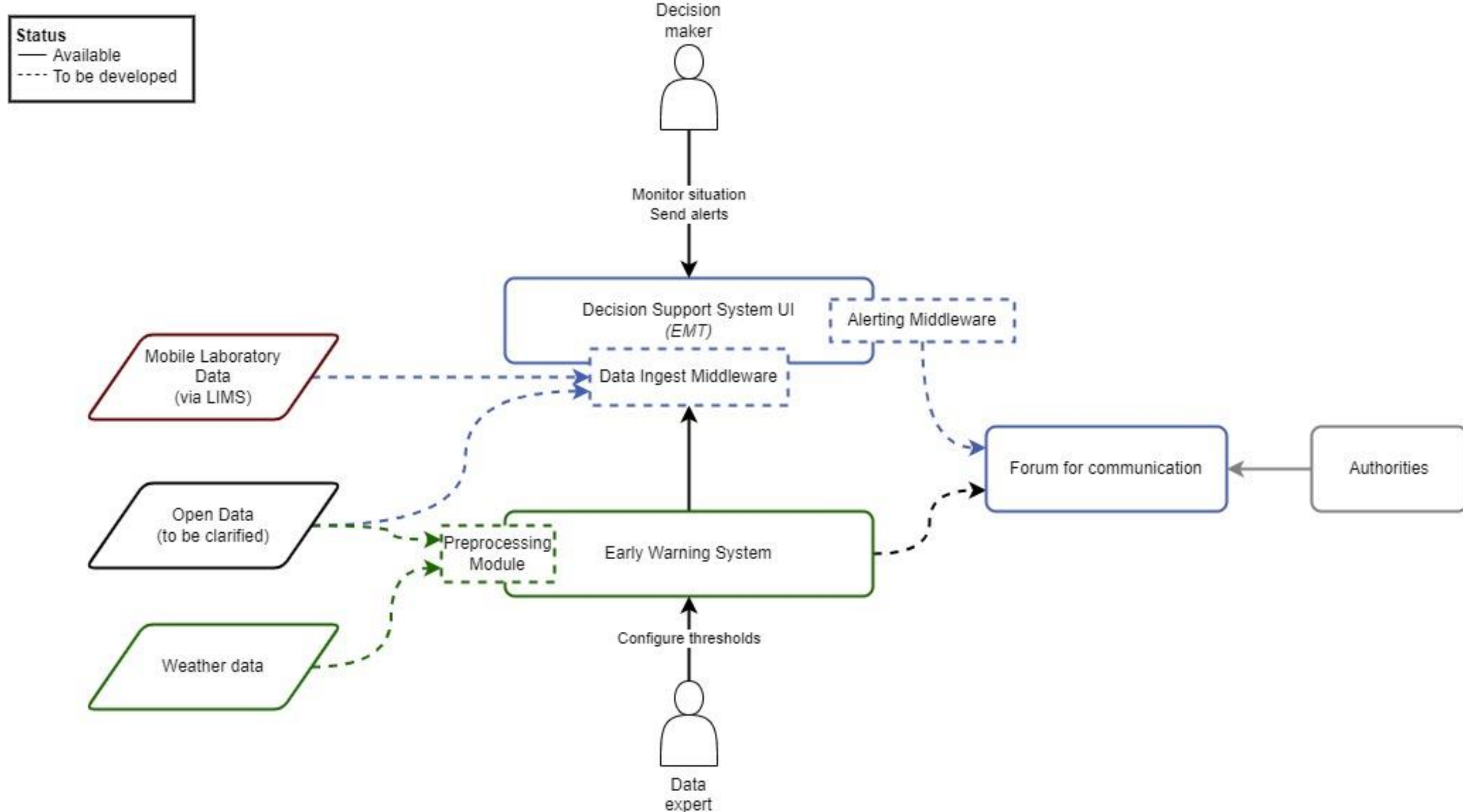


Figure 2: Concept of Decision Support System [1]

## MOBILISE Platform

MOBILISE includes a Decision Support System (DSS) that displays specific data from the Laboratory Information Management System (LIMS) to present disease cases in real time to authorities. All diagnostic reports will be available to key actors for consideration of response measures within a dedicated communication and notification forum. This could enhance the existing workflows and improve communication between authorities, leading to a faster and more effective disease response within a One Health context. An integrated Early Warning System will further support decision-makers in their response efforts (Figure 2).

## Conclusion

As a result of climate change, we are observing a trend of vectors expanding their habitats, which could, in turn, lead to the adaptation of pathogens in new areas. Consequently, we may need to respond to emerging diseases such as CCHFV or an increase in WNV cases in Europe. To ensure rapid diagnosis of cases and real-time response by authorities, MOBILISE could support decision-makers and strengthen monitoring systems or assist in managing pandemic situations.

## References

- [1] Georg Neubauer, Drazen Ignjatovic, Gerald Schimak, Georg Duscher, Lisa Winkelmayr, Karin Rainer, Alois Leidwein, Gerald Lichtenegger; The Impact of Workflows on Decision Support in Pandemic Management, IDIMT-2024, Changes to ICT, Management, and Business Processes through AI, 32<sup>nd</sup> Interdisciplinary Information Management Talks, Sept.4-6, 2024, Hradec Králové, Czech Republic, pp 35-42, ISBN 978-3-99151-527-2
- [2] Lisa Winkelmayr, Georg Neubauer, Gerald Schimak, Johannes Peham, Muna Affara, Florian Gehre, Georg Gerhard Duscher; Integration of a One Health mobile lab in Austrian outbreak response ;Poster Presentation; Conference: The One Health Challenges to tackle infectious diseases, June 12-14, 2024, St. Brieu, France