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Type: Oral presentation

Tracking and containing endemic and emerging tick-borne human and animal infections by integrating citizen science, knowledge-supported proactive surveillance, and AI-enhanced modelling in a changing climate (TAC-TICKS)

Tuesday, October 6, 2026 1:46 PM (9 minutes)

Increasing human and animal case numbers and geographical spread of ticks and tick-transmitted diseases show their pandemic potential in the Northern hemisphere due to changing environmental conditions. In TAC-TICKS, experts from human/veterinary medicine, Public Health, animal ecology and biomathematical modelling join forces to elucidate this development and improve pandemic preparedness. We extend our 15+ year database of monthly native tick activities and pathogens through hotspot sampling, stratified Citizen Science and comprehensive pathogen characterization. To study tick and pathogen spread, we utilize our extensive Hyalomma- and Rhipicephalus tick database, TBE virus genomes, bird and large mammal migration, and related tick pathogen burden. We evaluate the potential vaccination's impact on disease epidemiology and containment serologically with the example of TBE.

Combining newly generated and publically available data, we develop climate-aware prediction models for tick activity and disease prevalence that inform efficient surveillance concepts and strategies. Partnering with district and state health departments and empowering communities, we aim to establish effective pre-pandemic surveillance and countermeasures. Our proactive approach, encompassing known bacterial, viral and protozoal pathogens as well as emerging unknown pathogens ("Pathogen X") using a suitcase lab and nanopore sequencing in the field, thus strengthens public health in the face of evolving environmental threats.

Keywords

slow pandemic, stratified citizen science, predicting models, disease spread

Registration ID

OHS26-318

Professional Status of the Speaker

Professor

Junior Scientist Status

No, I am not a Junior Scientist.

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Session Classification: Session 7: Research consortia on the topic of “Pandemic prevention and response within a One Health framework”

Track Classification: Research consortia on the topic of ”Pandemic prevention and response within a One Health framework” (only for the Pandemic networks currently funded by the BMFTR)