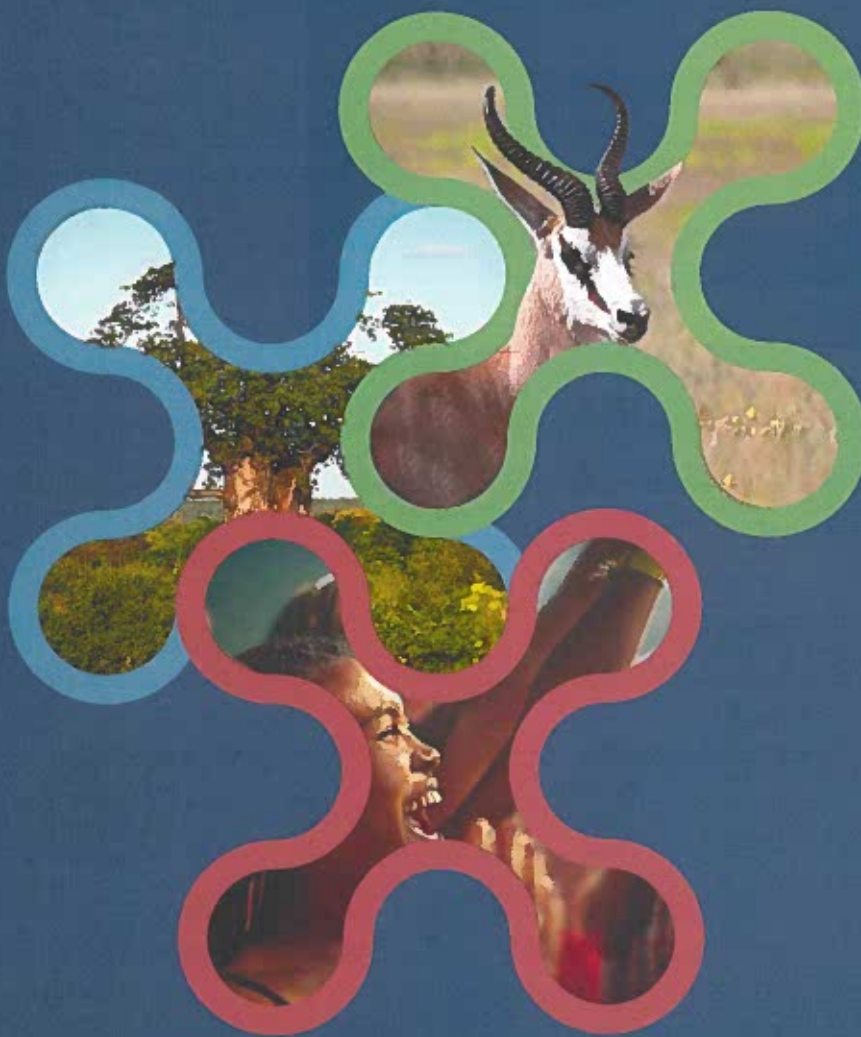


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CAPE TOWN
SOUTH AFRICA
20-23 SEPTEMBER 2024

Abstract Book





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Maximizing the power of One Health studies

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Background: A One Health approach to data collection has been shown to increase the power of certain analyses on zoonotic disease exposure. There are an increasing number of studies that are collecting data across the One Health spectrum, yet these data continue to be analyzed using siloed methods that estimate risk within each sector (e.g., two separate analyses predicting the risks associated with previous exposure of a zoonotic pathogen in people and in cattle).

Methods: Using two WHO priority zoonoses, Rift Valley fever virus (RVFV) and Crimean-Congo hemorrhagic fever virus, we integrated epidemiological and ecological methods to develop a systematic, grid-based sampling scheme to allow both probability proportional to size sampling for seroprevalence/prevalence cross-sectional studies and systematic geographical sampling for environmental and wildlife studies. We developed a Bayesian mixture model to better estimate the impact of the probability of exposure in animals on the probability of exposure in people for zoonotic diseases, specifically whether livestock or mosquito exposure is a more important risk for RVFV exposure.

Results: We sampled over 600 people and livestock, sampled over 300 rodents, and conducted ecological site characterizations at 150 sites. Using this One Health sampling design in Tanzania and South Africa, we estimated (sero)prevalences in human, livestock, wildlife, and vector populations (presented in other abstracts). The analysis of the mixture model method is ongoing.

Conclusion: A One Health approach to investigate zoonoses necessitates the development of novel analytical tools that integrate methods from both ecology and epidemiology. We tested a framework to improve our capacity to harness the power of One Health sampling designs while still providing a mechanism to evaluate risk factors associated with pathogen infection. This is particularly important for vector-borne diseases where the proportional risk of transmission to people directly from animals vs from vectors is often unknown.

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One Health Preparedness: how to evaluate Simulation Exercises to enhance multi-sectorial national preparedness plans and capacitate One Health workforce

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Background:

One Health (OH) preparedness intends to adopt multisectoral and multidisciplinary approaches to contrast potential threats that emerge at human-animal-environment interface.

OH operationalization in preparedness strategies requires building a OH workforce able to integrate OH in national plans and to implement them. Simulation Exercises (SIMEXs) meant to reinforce preparedness capacities.[1][2]

In Italy SIMEXs were carried out as part of the "National strategic and operational plan for preparedness and response to pandemic flu 2021-2023 (PanFlu)".

These Exercises were evaluated by adapting guidance from international organisations [2] and the evaluation results provided suggestions for the evaluation of SIMEX for preparedness plans adopting OH approaches.

An evaluation plan for SIMEX for OH preparedness plans was developed.

Methods:

The evaluation methodology adopted in the SIMEXs of the Italian PanFlu suggested that specific ad hoc surveys run during the exercises can help to characterize the stakeholders involved in the preparedness exercises in terms of sectors, disciplines, roles in their own institutions and in the framework of the preparedness plan. On this basis, we developed an evaluation survey to be submitted to the participants of SIMEXs of preparedness plans with a OH approach in Italy, with the aim of characterising the involved workforce, of identifying any gaps in the competencies, sectors and disciplines etc.



The guiding strategy is to start from the analysis of the workforce involved in these exercises to describe its role in national preparedness, its knowledge of OH preparedness, its readiness to adopt OH approaches. The collected information will also allow to describe some aspects of the OH preparedness in Italy (fig 1).

Figure 1.

Results:

The evaluation plan and tools developed will allow to describe the OH workforce involved in SIMEXs for pandemic preparedness with a OH component in Italy and to identify capacities and skills that should be addressed particularly by in service training courses.

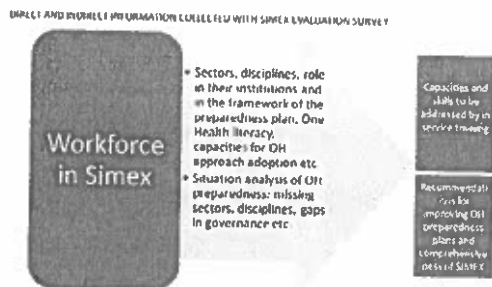
Conclusions:

To identify the workforce for OH preparedness is challenging. To describe participants in SIMEXs of preparedness plans for threats which require an OH approach can help to characterise the workforce and provide recommendations for consolidation and improvement of capacities and enhancement of OH preparedness plans.

Activities implemented in the framework of the Project "Simulation exercises for preparedness for potentially pandemic respiratory pathogens" with the technical and financial support of the Italian Ministry of Health-CCM.

[1] Handbook on simulation exercises in EU public health settings – How to develop simulation exercises for supporting preparedness and response to communicable diseases (europa.eu)

[2] WHO-WHE-CPI-2017.10-eng.pdf



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Localized Rift Valley Fever Virus Persistence Explains Epidemic and Interepidemic Dynamics and Guides Control Strategies

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Background: Rift Valley fever virus (RVFV) has spread beyond continental Africa and has the potential for global spread. Its establishment in new localities and the capacity to control future outbreaks, depends on whether and how RVFV persists at small spatial scales.

Methods: We developed a mechanistic, compartmental model of RVFV dynamics and fitted it to climate data collected from the Free State South Africa for 1983-2017, then simulated decades-long persistence.

Results: In our simulations, a substantial transovarial transmission fraction maintained a realistic seroprevalence pattern of interepidemic and epidemic transmission. The basic reproduction number (R_0) was close to one, suggesting limited expansion