

Spatial analysis and risk mapping of Crimean-Congo hemorrhagic fever (CCHF) in Sub-Saharan Africa

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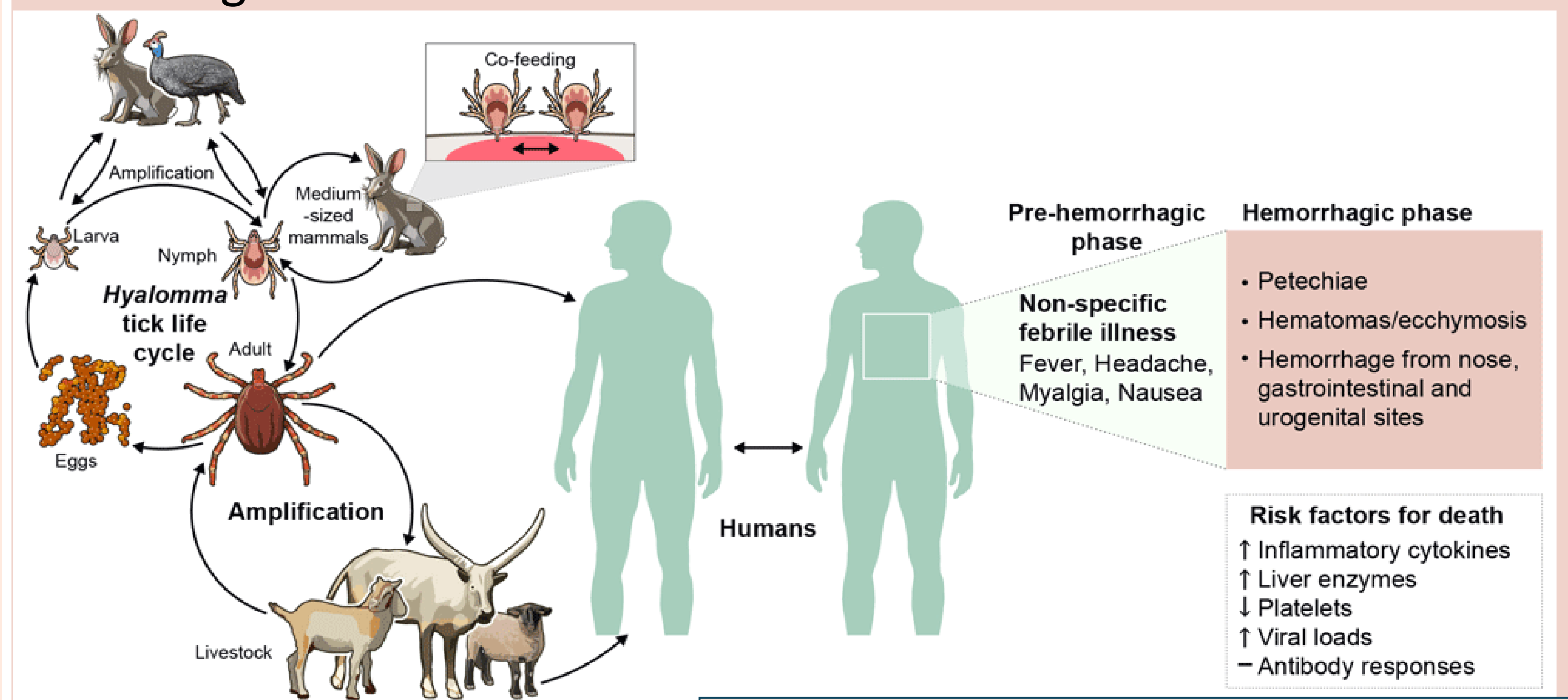
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Key messages

- Identifying the hotspot of CCHF outbreak areas is essential in planning and implementing surveillance strategies in SSA countries.
- CCHF outbreak occurrence is primarily driven by agroecological factors suitable for *Hyalomma* spp. ticks habitats.
- There is a concentrated risk of CCHF outbreaks in the ASAL areas in the Sahelian region of West Africa and East Southern Africa
- Reinforcement of the One health surveillance approach of CCHF is necessary to early detect and respond to outbreaks in high-risk area.

Context

- Crimean-Congo haemorrhagic fever (CCHF) is a severe, zoonotic disease that can cause outbreaks. In sub-Saharan Africa (SSA), the geographical distribution of the disease and factors that influence its occurrence are poorly known.
- We analyzed historical records of its outbreaks in various countries across sub-Saharan Africa (SSA) to identify hotspots and determine ecological factors associated with these outbreaks.



Source: Hawman DW and Feldmann H. Recent advances in understanding Crimean-Congo hemorrhagic fever virus [version 1]. F1000Research 2018, 7:1715 (doi: 10.12688/f1000research.16189.1)

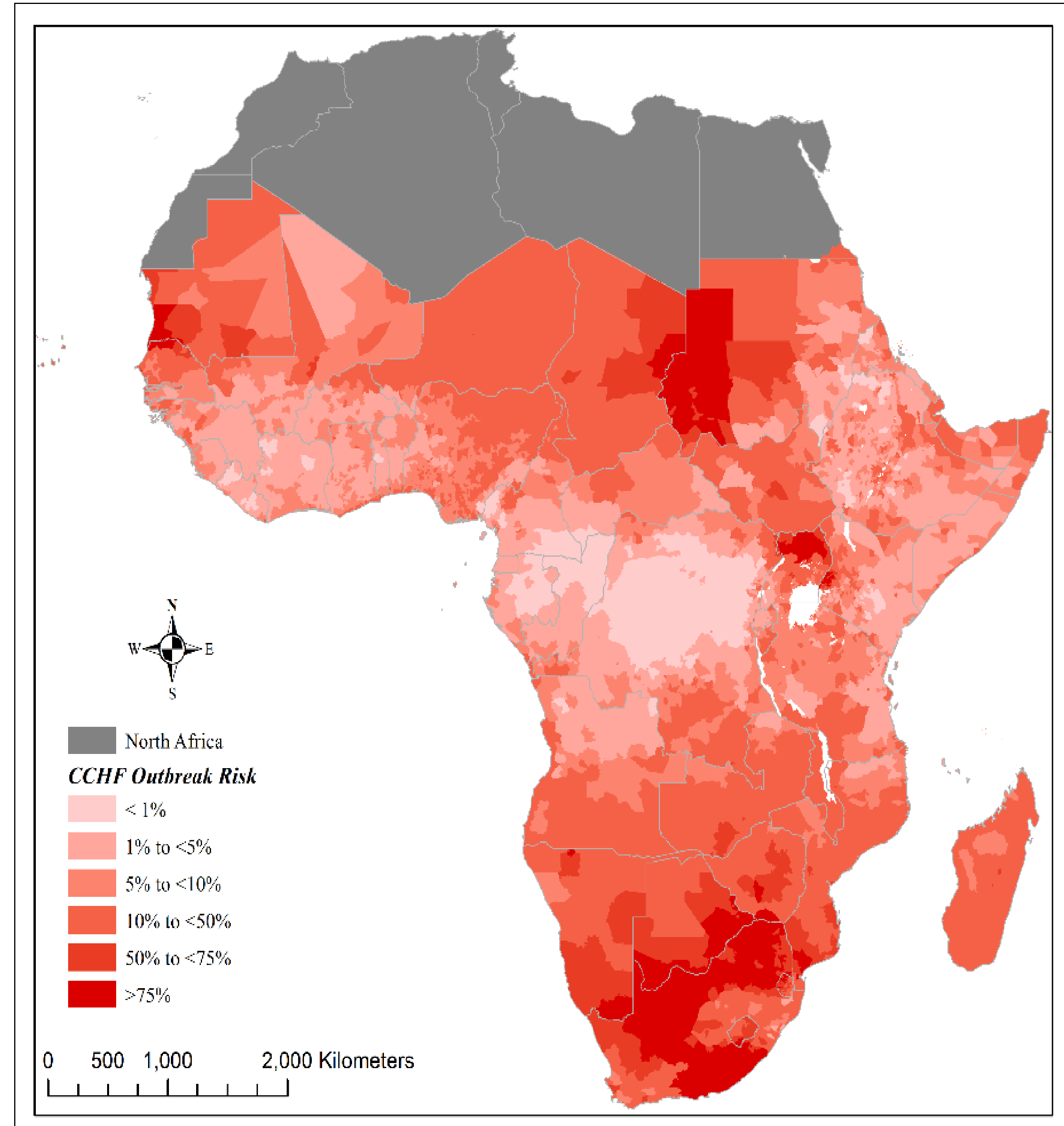
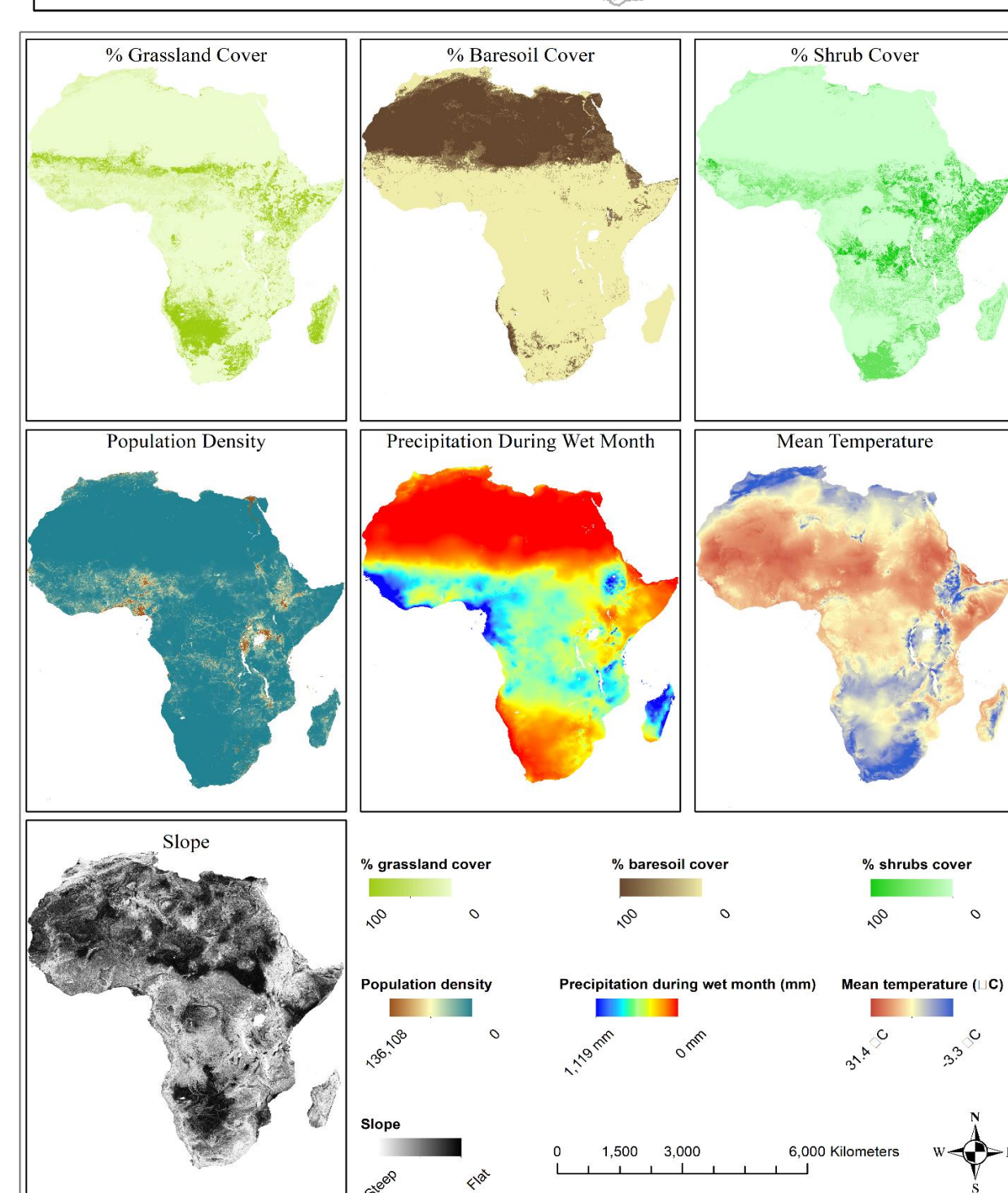
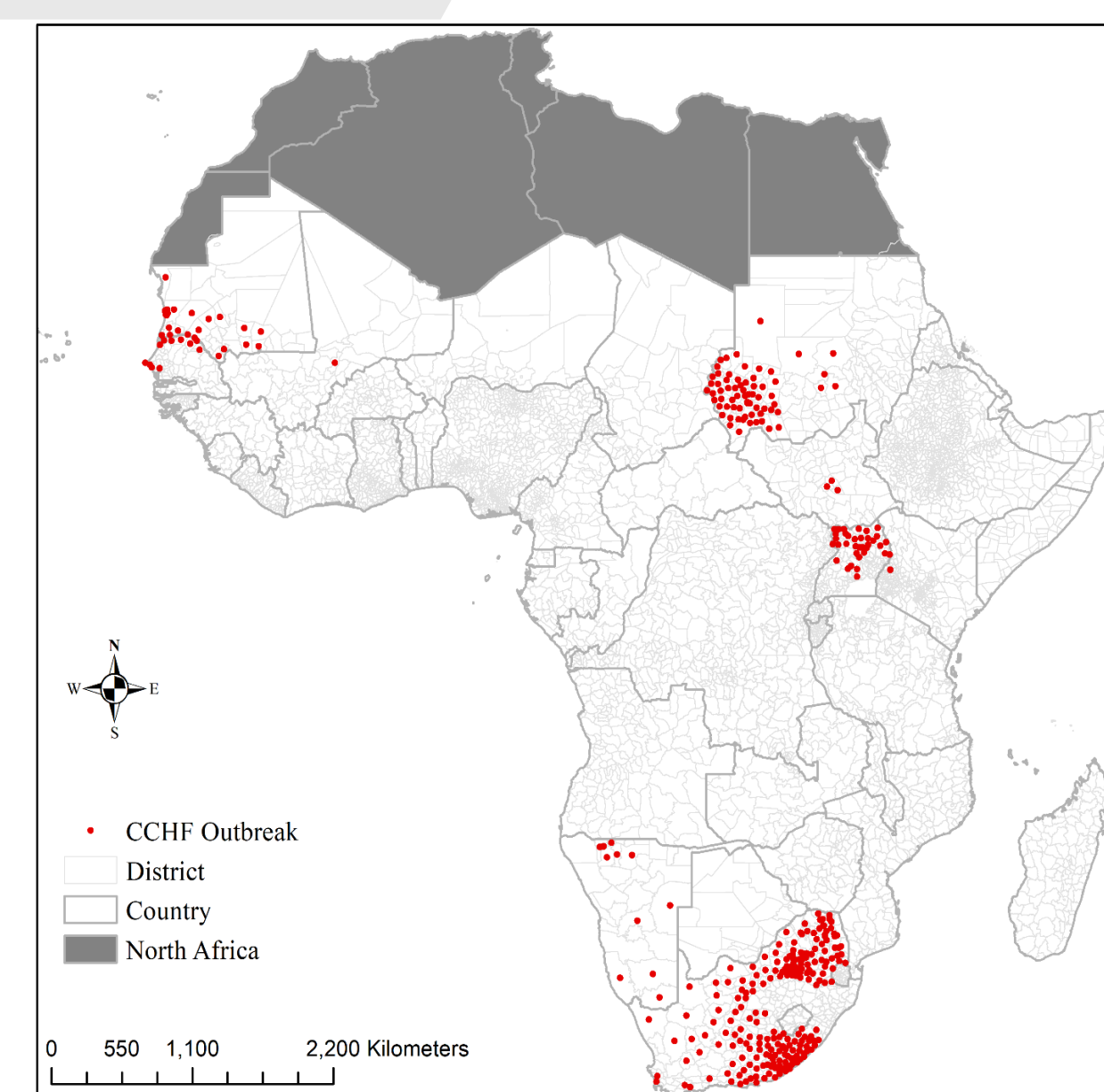
Our approach/ Outcomes

CCHF occurrence data

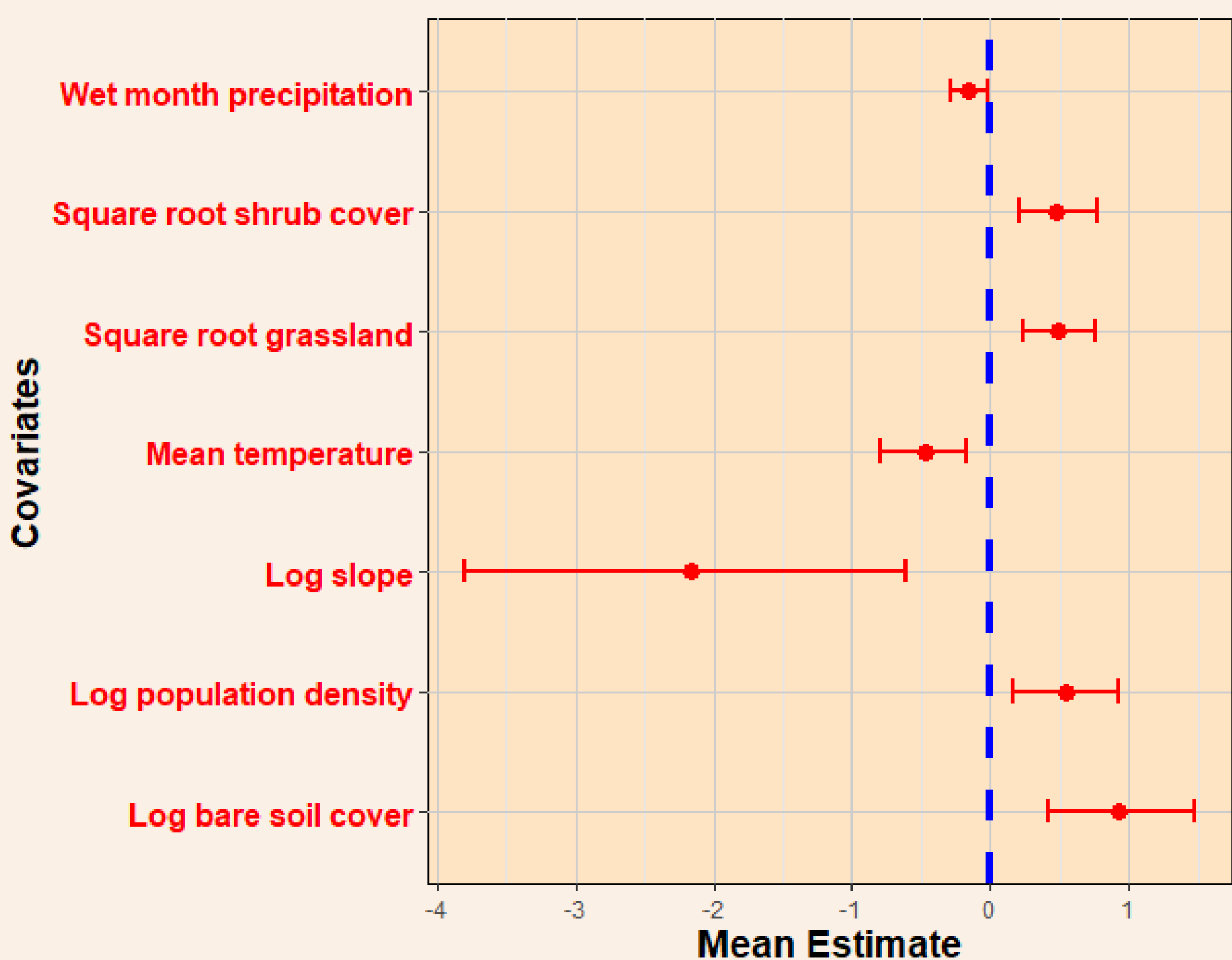
CCHF outbreak data were collected from the literature review and other multiple data sources between 01/01/1981 and 08/08/2022

Modelling the risk of CCHF occurrence

Approximate Bayesian hierarchical model and Integrated Nested Laplace Approximation (INLA) model were used to build a model and a risk map



Covariates associated with CCHF outbreaks



Conclusion

- CCHF is primarily controlled by agroecological factors in SSA, with the greatest risk in the arid and semi-arid land (ASAL), savanna grass, and shrub habitats of *Hyalomma* spp. ticks, where rangeland livestock grazing is the predominant land use.
- This study is a good starting point for a country-level risk map building in the high-risk region of SSA to better refine the disease patterns and implement surveillance and control strategies.

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