

Cattle movements and potential control strategies for bovine tuberculosis in an endemic setting

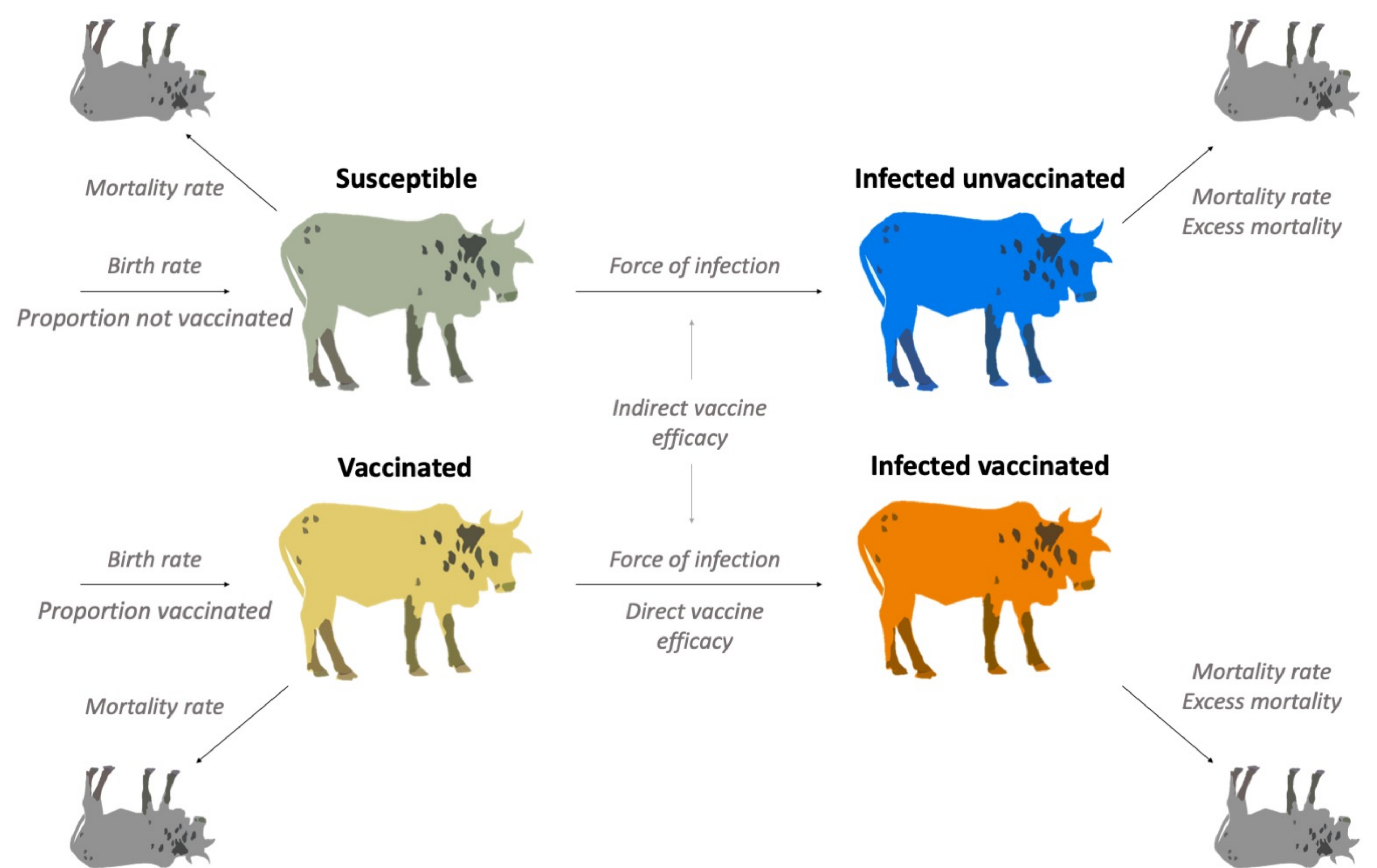
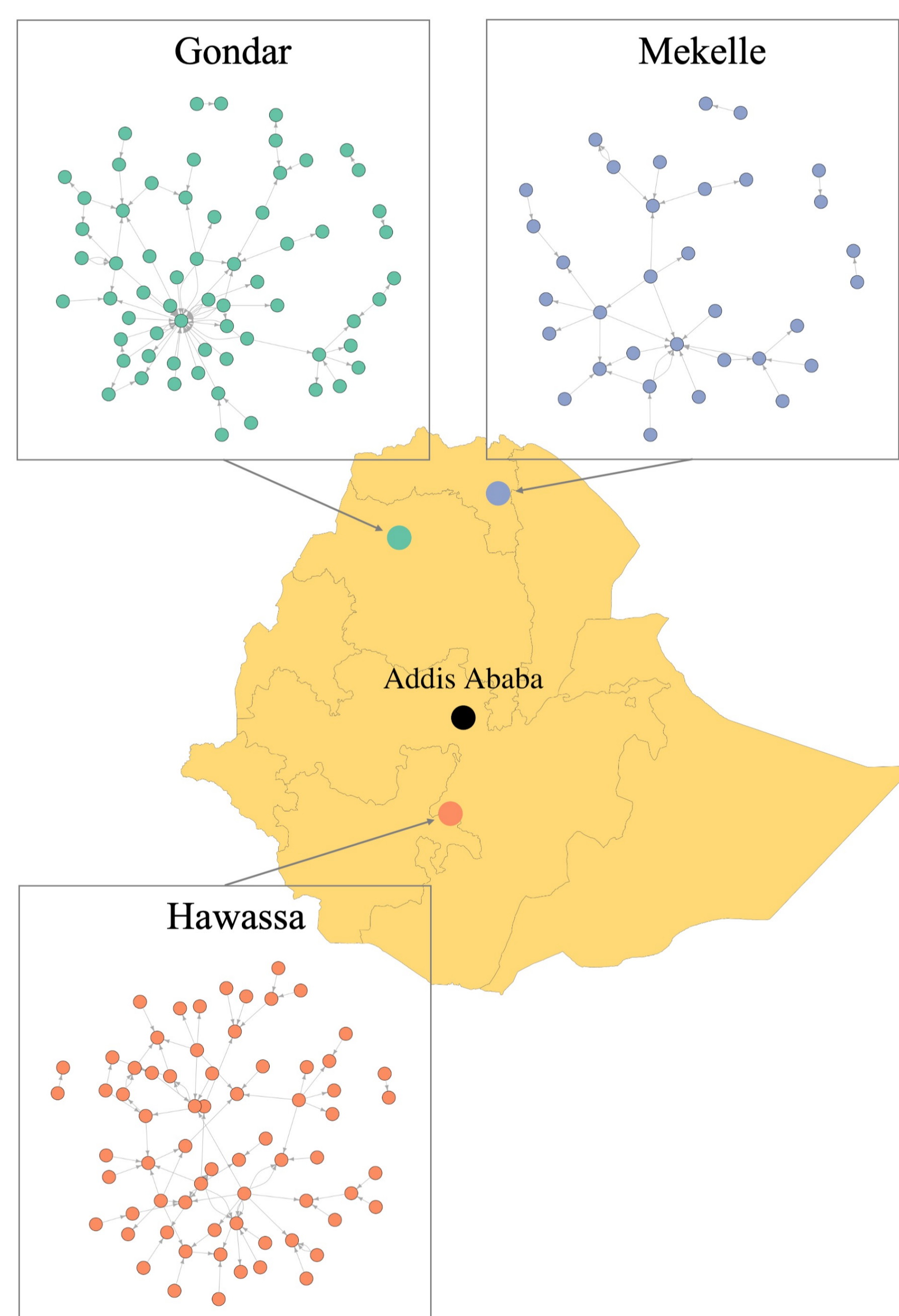
Katriina Willgert, Getnet Abie Mekonnen, Stefan Berg, Solomon Gebre, Gobena Ameni, James Wood, Andrew Conlan

Introduction

- Bovine tuberculosis (bTB) is endemic in Ethiopia, resulting in production losses to cattle owners and risk of zoonotic transmission to humans.
- Cattle rarely show clinical signs of bTB in the early stages of disease, meaning cattle trade can facilitate transmission over long distances in the absence of systematic testing of herds.
- Incorporating livestock movements in transmission models allows us to assess bTB transmission resulting from trade links in countries with limited animal movement data.

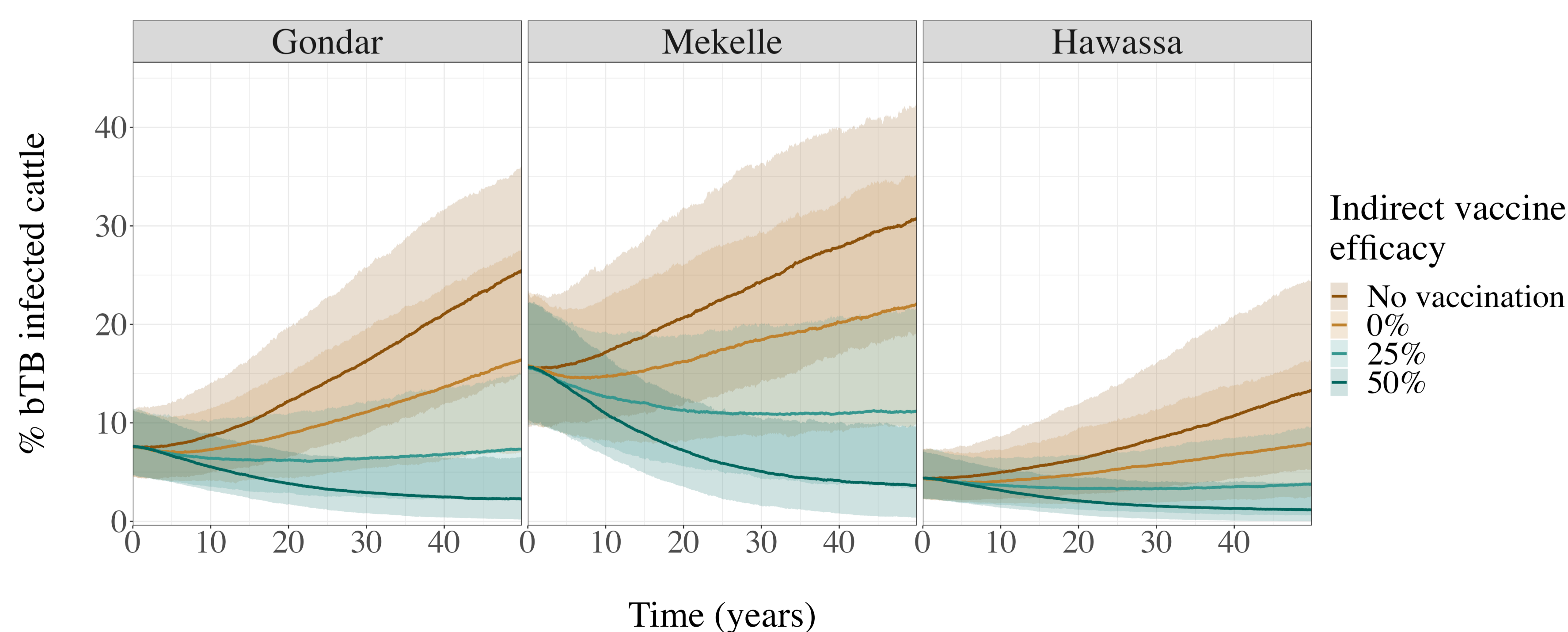
Methods

- Between-herd transmission model of cattle movements based on network data (Mekonnen *et al.*, 2019) of dairy cattle in Ethiopia
- Within-herd transmission model with field estimated transmission parameters (Conlan *et al.*, 2022)
- Scenarios: no intervention compared to vaccination
 - Direct vaccine efficacy: 25% (Srinivasan *et al.*, 2021)
 - Indirect vaccine efficacy: 0%, 25%, 50%



Results

- Bovine TB transmission and the impact of vaccination were influenced by the frequency and routes of animal movements between farms.
- Vaccination could be a useful tool in reducing the burden of bTB at animal and herd-level but would not be sufficient to eliminate bTB.



Conclusions

- Animal movements contribute to maintaining bTB in cattle populations and should be considered when evaluating disease transmission and potential control strategies.
- Given the imperfect protection offered by current vaccine candidates, vaccination is likely to only be useful as a supplement to other control strategies.