

Using modelling to treat better

A Case Study on *Mannheimia haemolytica* in a Beef Cattle Farm



Baptiste Sorin, Sebastien Assié, Sébastien Picault and Pauline Ezanno. Contact : baptiste.sorin@inrae.fr

Oniris, INRAE, BIOEPAR, 44300 Nantes, FRANCE

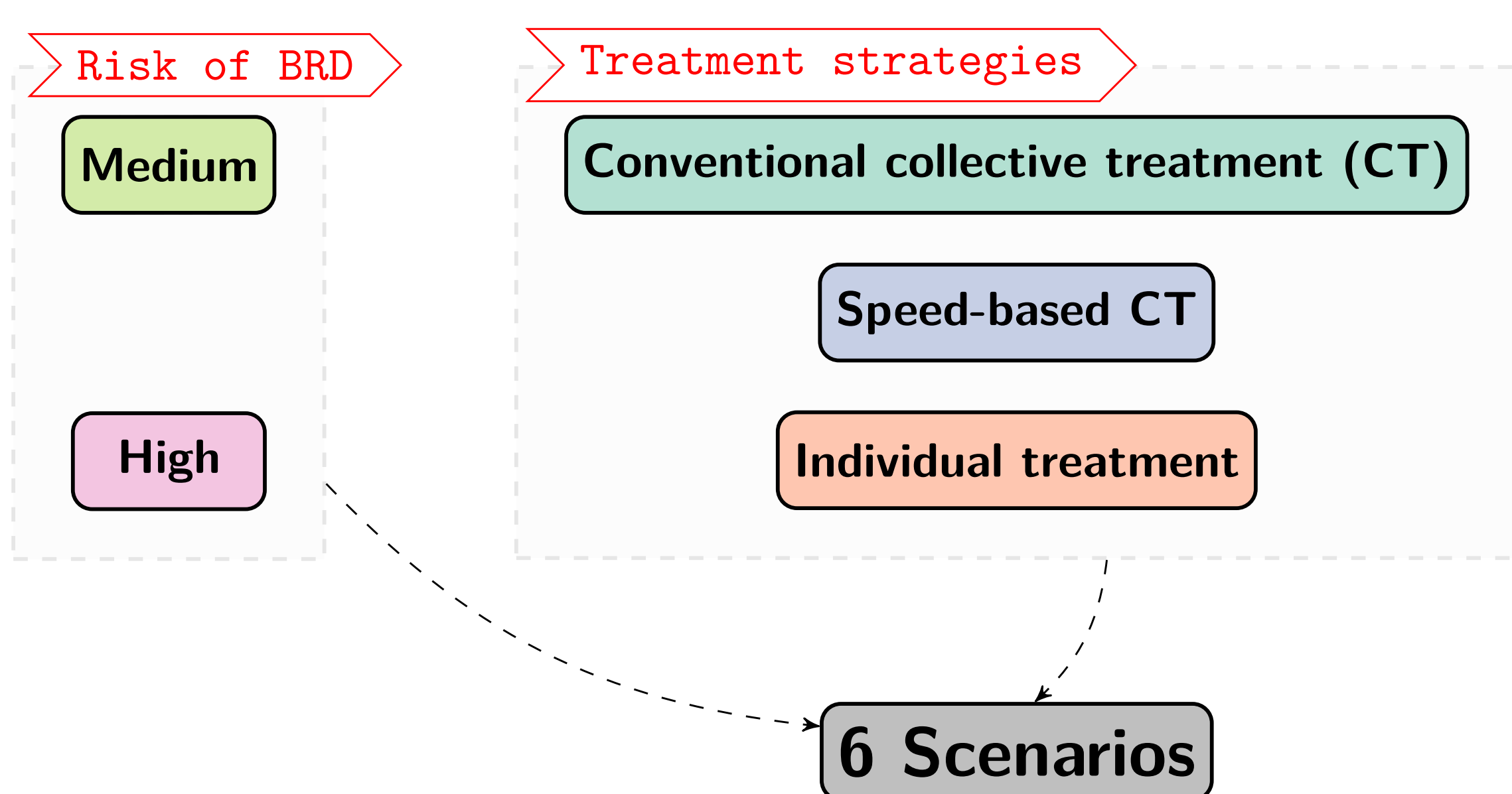
Context

- Bovine respiratory disease (**BRD**), a worldwide economic and sanitary burden in the cattle farming industry
- Trade-off between antimicrobial use (**AMU**) and case occurrence and severity
- Collective treatments (**CT**) criteria not evidence based

Objective

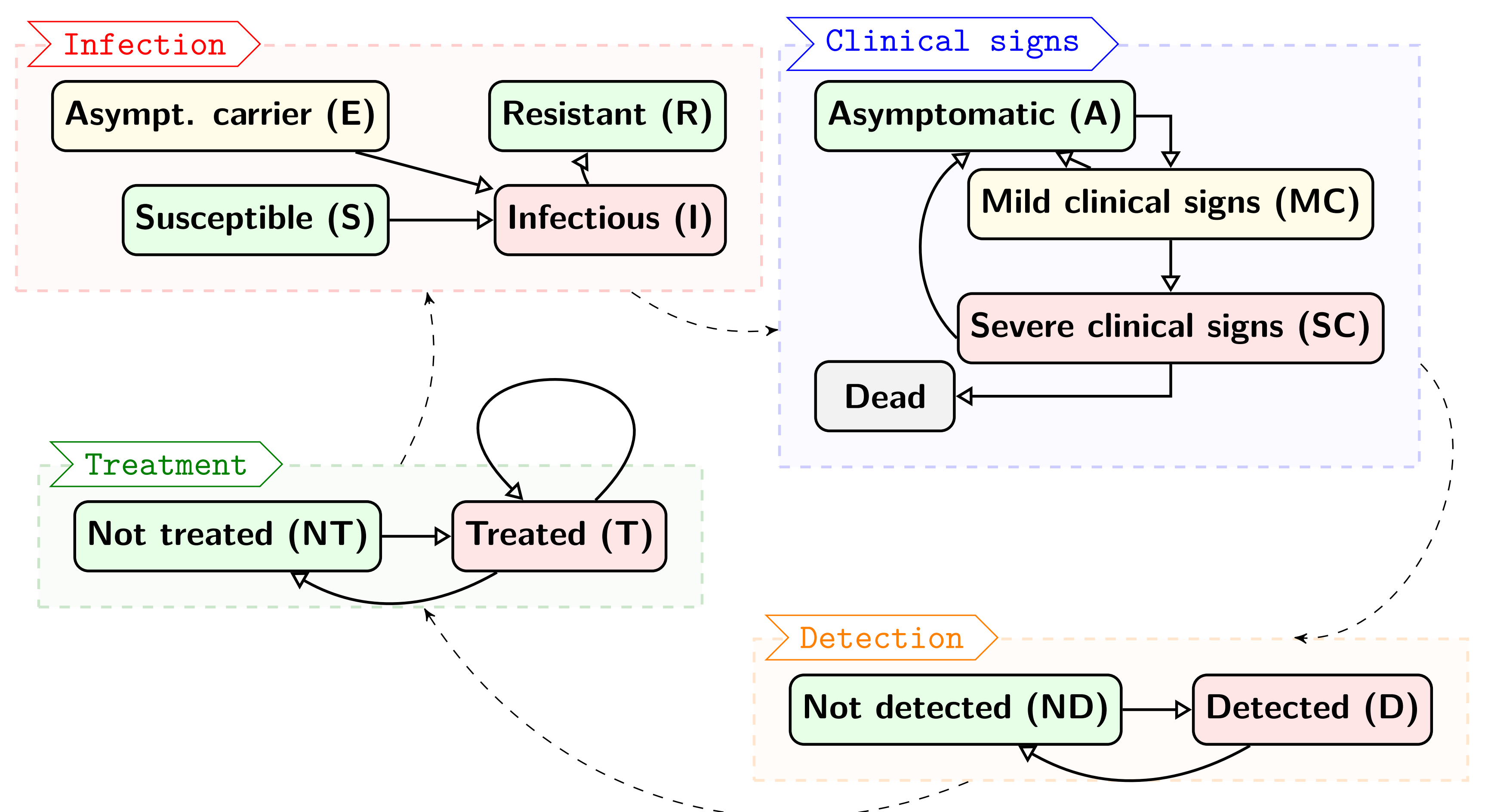
Simulating conventional and alternative treatment strategies to compare their impact on the spread of *M. haemolytica* in a beef cattle building

Scenarios

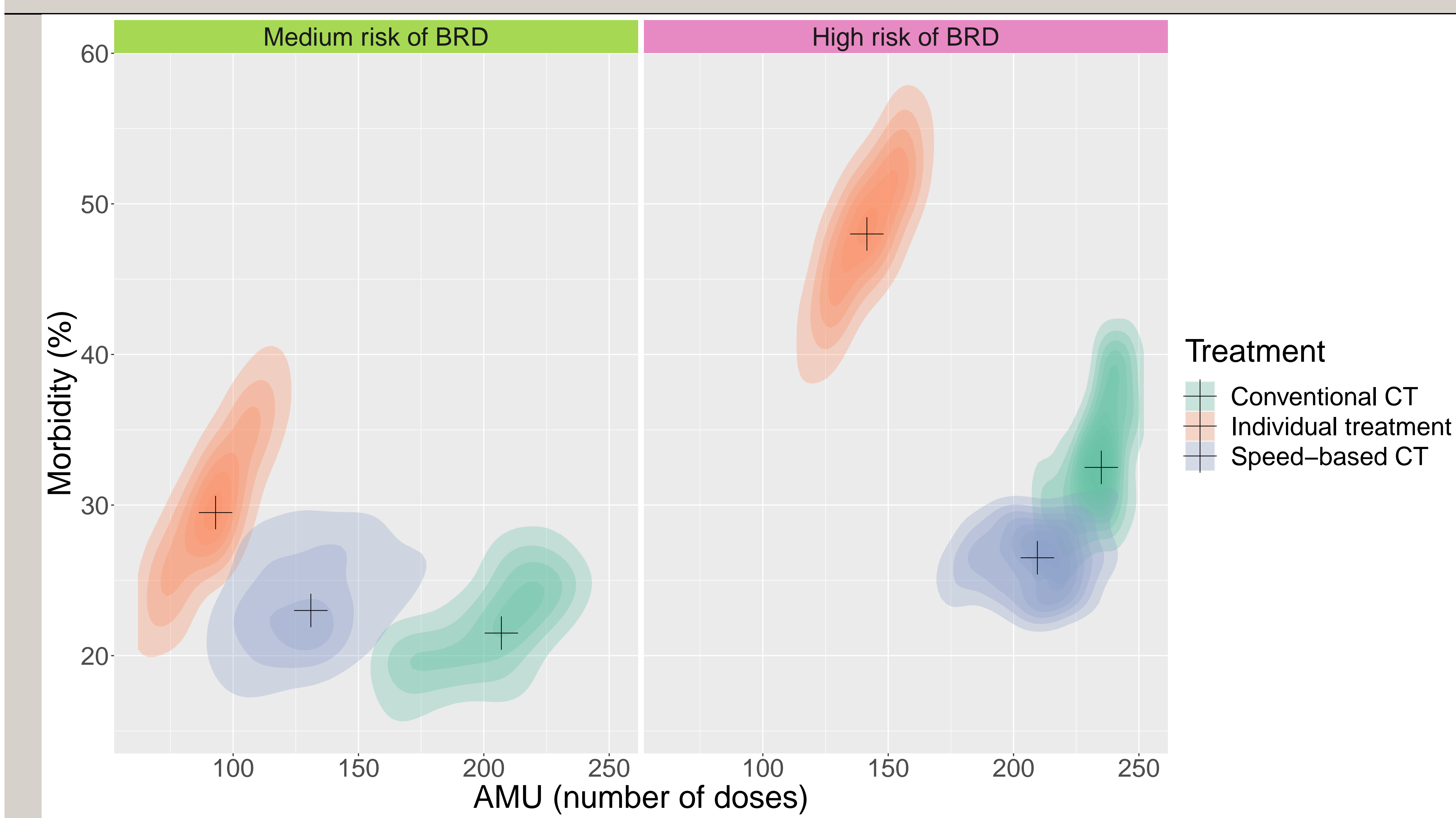


- **Conventional CT:** Criterion based on cumulate incidence (I_{Mh})
- **Speed-based CT:** Criterion based on the speed of the spread ($\frac{I_{Mh}}{t-t_0}$)

Model (Derived from [1])



Results



Take home messages

- CT is the only acceptable solution in high-risk populations
- Speed-based CT reducing both morbidity and AMU compared to conventional CT

Perspectives

- Testing on other pathogens
- Inclusion of automated tools for CT decision
- Applying CT in contexts of mixed infections

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[1] B. Sorin-Dupont, S. Picault, B. Pardon, P. Ezanno, and S. Assié. Modeling the effects of farming practices on bovine respiratory disease in a multi-batch cattle fattening farm. *Preventive Veterinary Medicine*, 219:106009, 2023.