

Aims

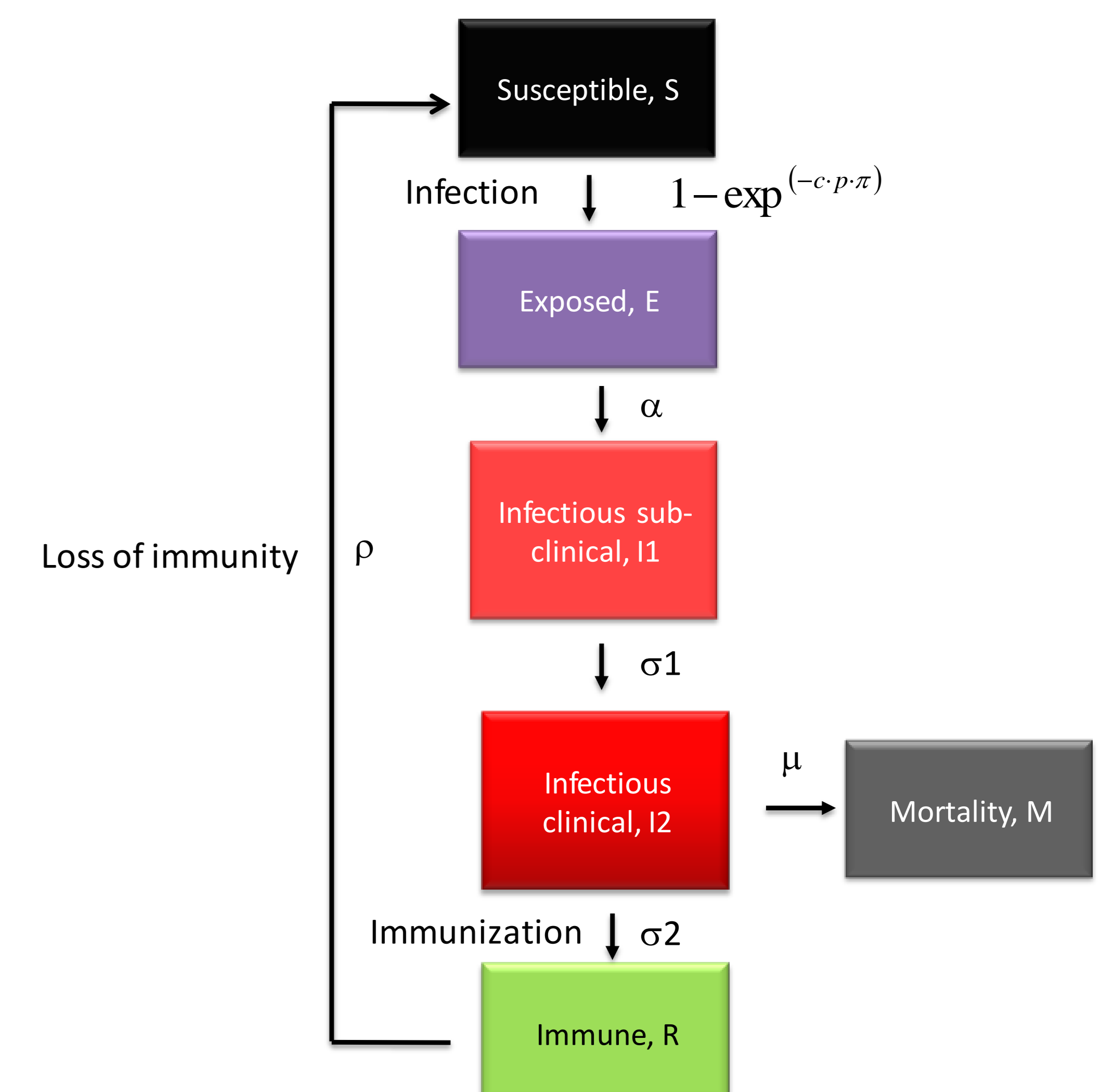
- ➔ Assess the transmission dynamics of PEDv whenever introduced in a pig densely area in Europe using modeling
- ➔ Assess the impact of control measures on disease spread

Material & Methods

Main characteristics

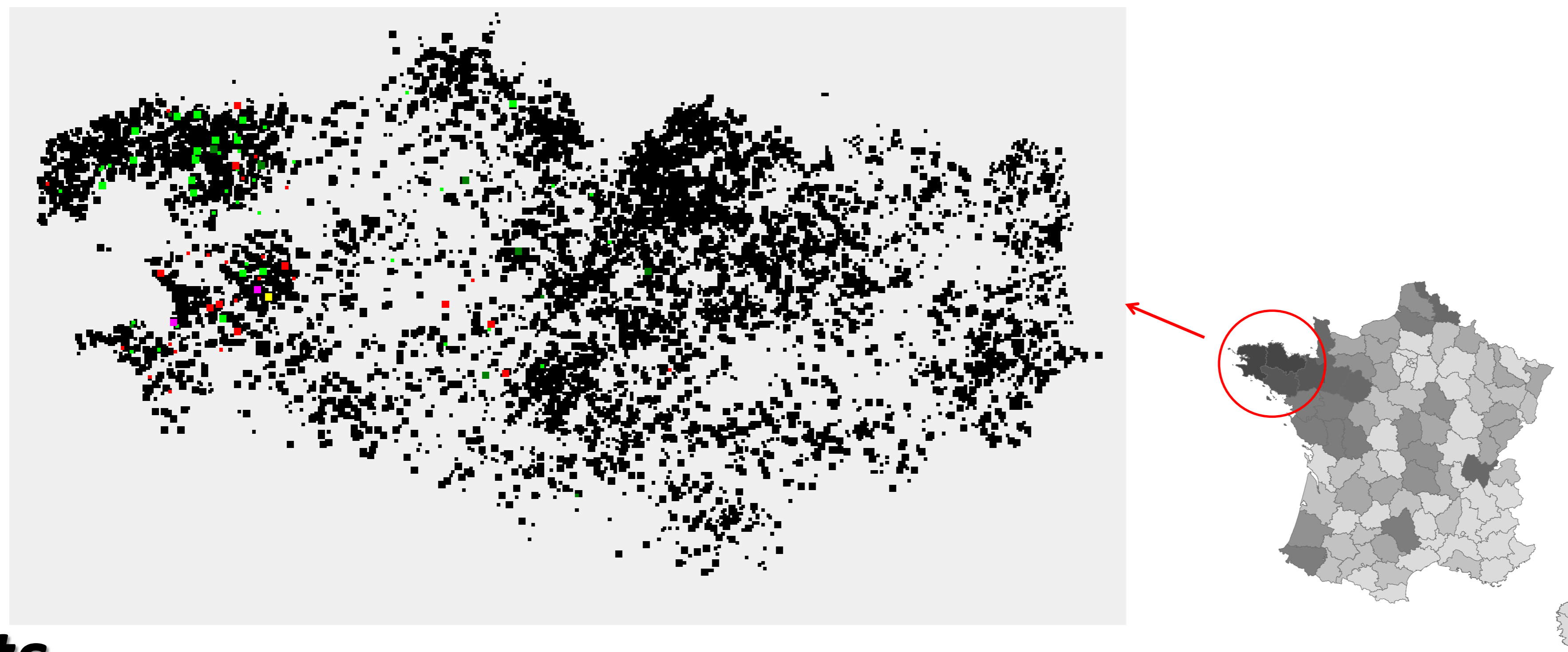
- Spatio-temporal stochastic individual-based model
- Parameterization: data extraction from a national database reporting
 - Geographical location, farm type and size
 - Animal movements between herds
 - Frequency of contacts with vehicles and other mechanical vectors
- Use of the North American Animal Disease Spread Model (NAADSM) ([Harvey et al., 2007](#))

Herd health states and transitions



Transition parameters:
[Martelli et al., 2008](#); [Pensaert and De Bouck, 1978](#); [Poulin and Klopfenstein, 2013](#)

Application to the most densely populated area in France

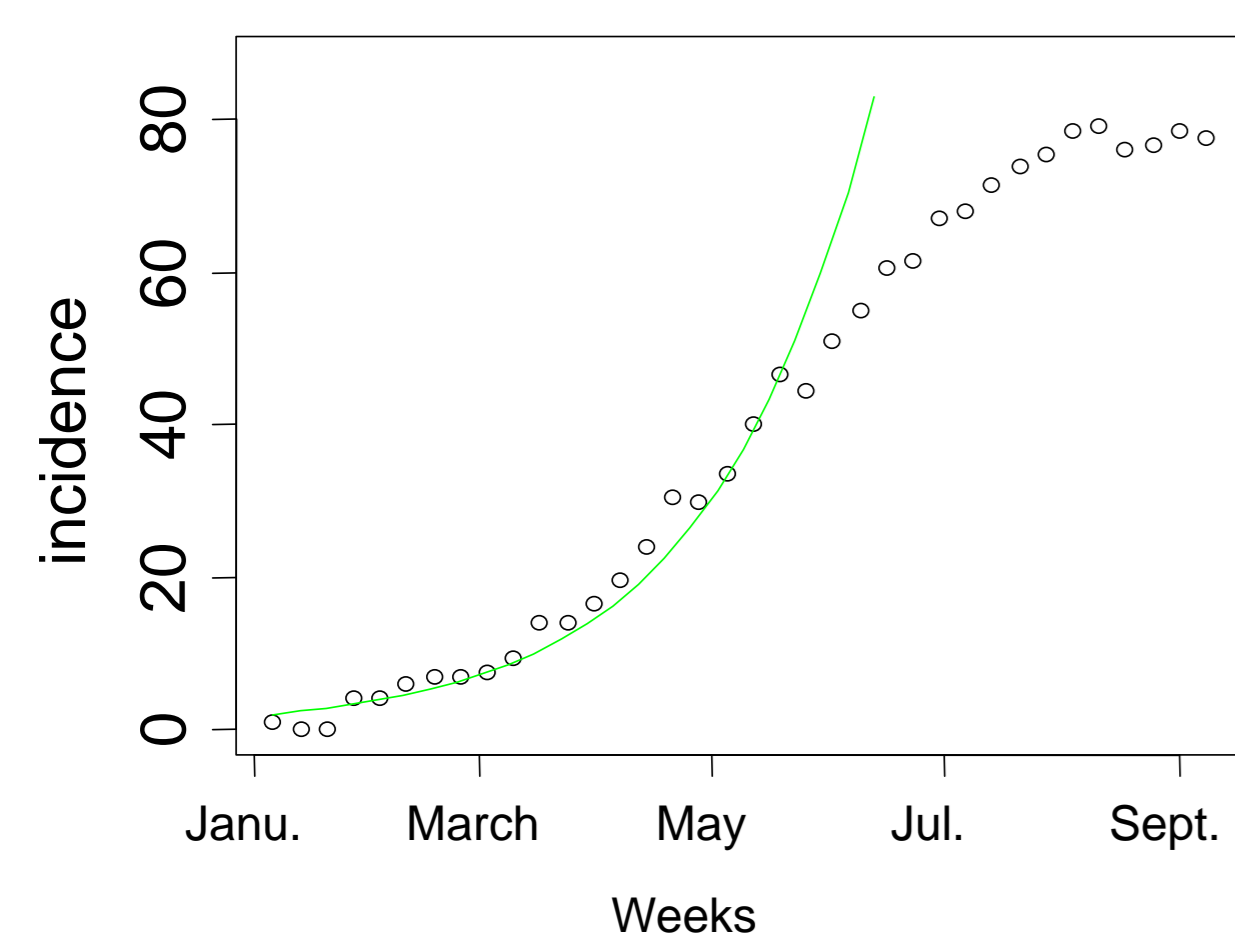


National distribution of pigs in France

Results

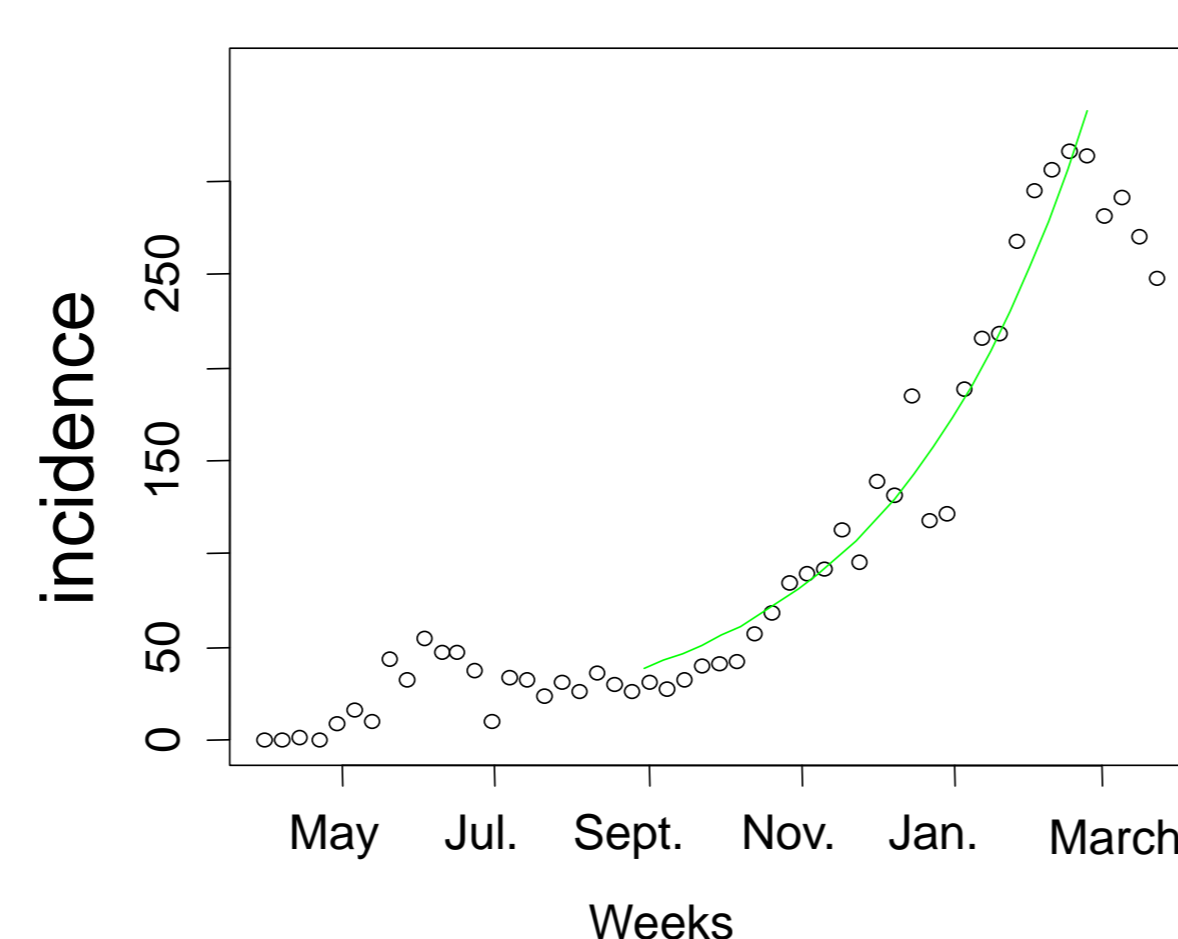
Simulated epidemics without intervention

Simulated epidemics in Brittany, FR



$R_0 = 3.4 [3.0; 3.9]$

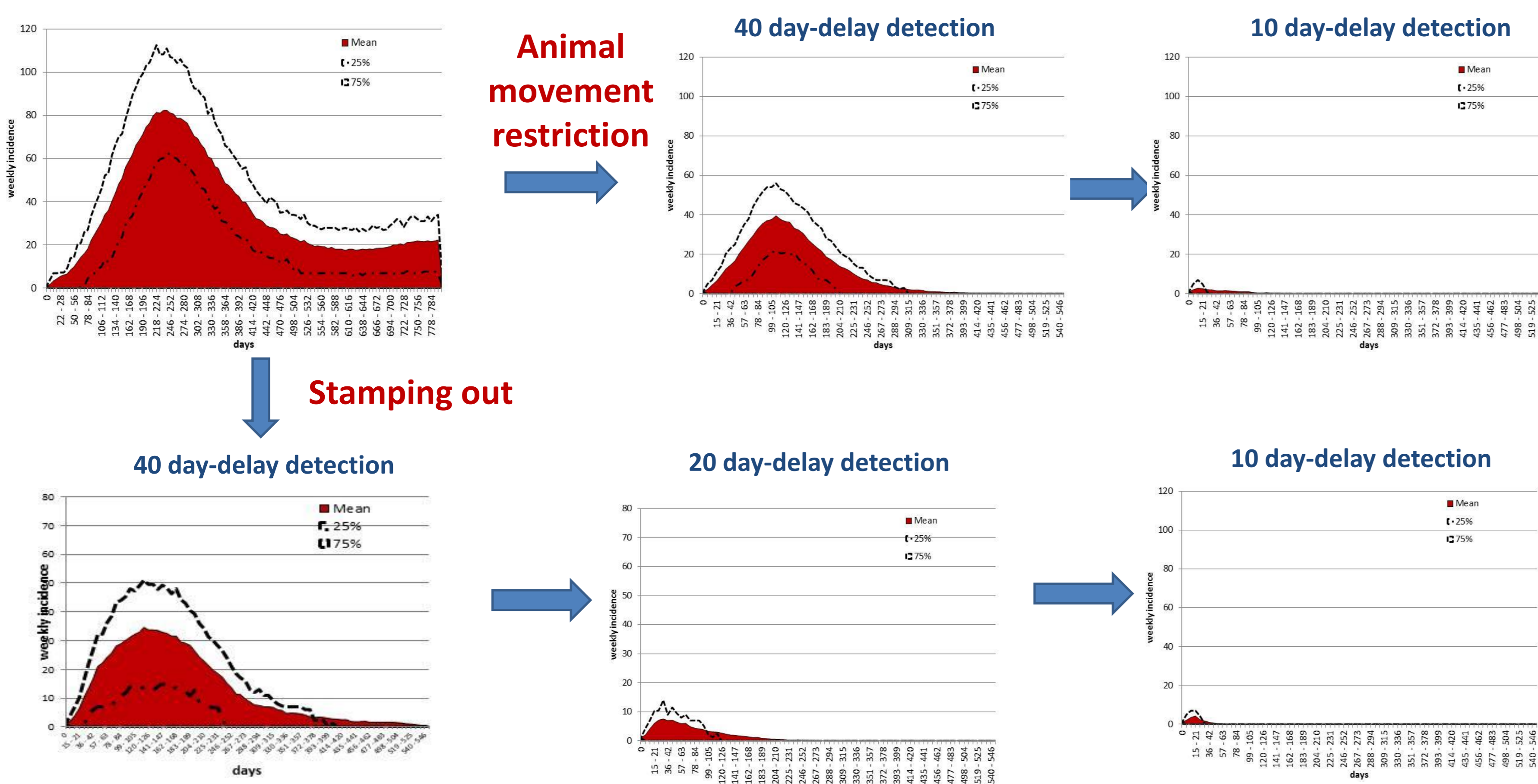
Observed data in the US



$R_0 = 2.4 [2.3; 2.5]$

- ⇒ small area, densely populated
- ⇒ faster increase
- ⇒ lower peak incidence compared to US (80 versus 300)

Impact of interventions on the simulated epidemics



Key messages

- Rapid spread with likely a high impact in absence of population immunity
- Animal movement restriction would have a partial effect
- Early slaughter of 1st outbreaks would be the most effective
- Increase of biosecurity has to be promoted
- Importance of rapidity for the intervention chain (detection-notification-intervention)

References