Sensitivity of surveillance programs in vaccinated poultry populations

WOAH/IABS Meeting on High Pathogenicity Avian Influenza

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Vaccination Surveillance Considerations

- Active and passive surveillance still needed
- Valuable to detect outbreaks and prove freedom from disease
- With vaccination, disease may be more difficult to identify
- Geographic or industry specific vaccine usage

Vaccination & Surveillance

Surveillance design influenced by:

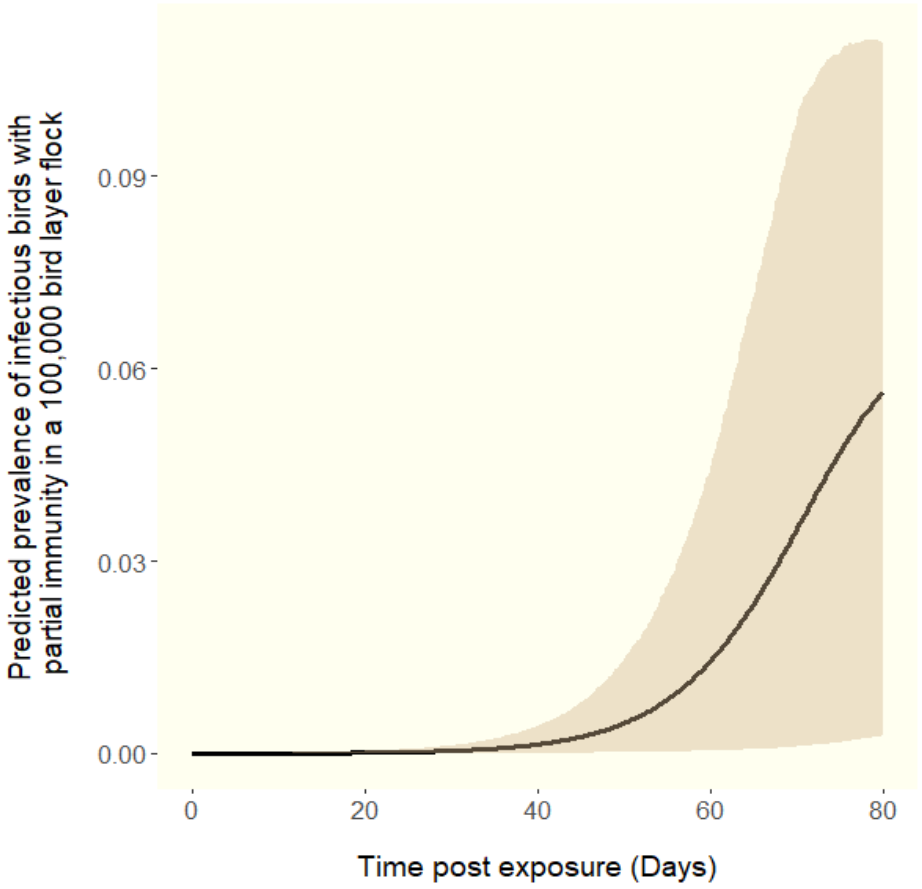
- Vaccine type(s) selected
- Species
- Production purpose
- Costs: test type, personnel, laboratory supplies, and capacity

Leveraging existing surveillance systems

- Example:
  - National Poultry Improvement Plan (NPIP) disease surveillance program includes avian influenza
  - For all premises types, sampling to detect 10% prevalence with a 95% confidence interval

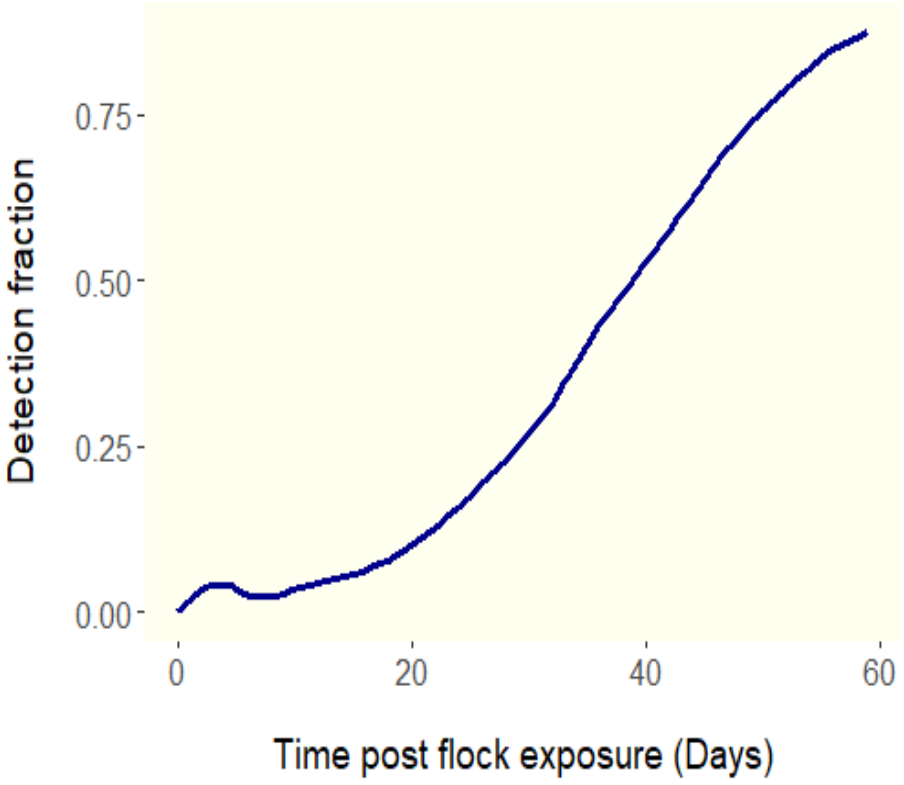
Modeling HPAI Spread in Vaccinated Flocks

- Modeled multiple immunity classes among vaccinated birds
- Transmission to contact chickens prevented in multiple studies with rHVT H5 vaccines
- Focused on potential spread under non-ideal vaccination scenarios
  - Disease state durations from SEPRL rHVT H5 experiments
  - Transmission rates from Rauw *et al.*, 2011



Model Outputs Informing Surveillance

- Preliminary results indicate slow spread and longer time to detect in vaccinated flocks
  - Targeted sampling with dead and live bird prioritization
  - 6 pooled samples via IAV matrix gene RRT-PCR
  - Results shown for one vaccination scenario and may vary in the field
- Applications to inform surveillance design and vaccine strategies
- Additional transmission studies and modeling to predict transmissibility to other flocks important



Predicted detection probability in a 100,000 bird vaccinated layer flock

EFSA Scientific Opinion Document

- Comprehensive overview of available vaccines and utilizes innovative approaches to leverage limited data
- Provides surveillance protocol recommendations for multiple objectives including early detection and disease freedom
- Identifies key data gaps and uncertainties (e.g., duration of immunity)
- Additional scenarios may be needed to address regional/species/vaccine variability
    - Scenarios with lower disease mortality and transmission rates may also need to be considered

Biosecurity

- Prevent introductions into domestic poultry premises
- Lateral spread between domestic poultry premises
- Reduce spillover between populations/species

Thank You!

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