90TH ADVISORY FORUM
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# VACCINATION OF POULTRY AGAINST HPAI – PART 1

## AVAILABLE VACCINES AND VACCINATION STRATEGIES

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# TERM OF REFERENCES

1. Update on the available vaccines against HPAI for poultry
2. Vaccination strategies

→ **available at:**

https://www.efsa.europa.eu/en/efsajournal/pub/8271

3. Surveillance in the vaccinated zone and/or vaccinated establishments
4. Restrictions and risk mitigation measures to be applied in a vaccinated establishment or a vaccination zone

→ **by March 2024**

# TOR 1 – AVAILABLE VACCINES

# TOR 1 – VACCINE CHARACTERISTICS

The only authorised in the EU

| Technology | Poultry species (experimental data) | Administration route | Vaccine name | Estimated antigenic distance | Lineage, clade | Predicted efficacy of a vaccine to stop sustained HPAIV transmission in a vaccinated population |
|---|---|---|---|---|---|---|
| **Inactivated full virus** | Chickens (Pekin ducks, turkeys) | Subcutaneous or intramuscular | Nobilis Influenza H5N2(NL) | 4.37 | Eurasian H5 | < 0.5 in chickens after 1 dose |
| **Inactivated full virus** | Poultry (Muscovy ducks) | Subcutaneous | Vaxigen Flu H5N8(IT) | 2.32 | 2.3.4.4b | in chickens >0.9<br>in Muscovy ducks <0.5 after 1 dose, >0.9 after 2 doses |
| **Subunit** | Chickens (Muscovy, Pekin, mule ducks, turkeys) | Subcutaneous | Volvac B.E.S.T. AI + ND(FR, IT) | 4.18 | 2.3.2 | in mule duck > 0.9 (after 2 doses)<br>in Muscovy ducks 0.8-0.9 after 1 dose, >0.9 after 2 doses<br>in Pekin ducks >0.9 |
| **Live vector** | Chickens (ducks, turkeys) | In ovo or subcutaneous | Vectormune AI(IT, NL) | 4.18 | 2.2 | in chickens > 0.9<br>in turkeys 0.5-0.8 |
| **Replicon** | (ducks, geese, chickens, zoo birds) | Intramuscular | Duck H5-SRV vaccine®(FR, HU) | 2.32 | 2.3.4.4b | > 0.9 in mule ducks |
| **Nucleic acids (DNA)** | (chickens, turkeys) | Intramuscular | ExactVac – Vaxliant ENABLE adjuvant(IT, NL) | 2.51 | 2.3.4.4a | <0.5 in chickens after 1 dose |

# TOR 1 - RECOMMENDATIONS

- Generate **suitable and harmonised data on**:
  - the **onset and duration of immunity** particularly for long living poultry types
  - the **impact of maternal immunity**
  - the indications of vaccines for **poultry species other than chickens** and considering **different poultry production types**
  - **VE** to reduce $R_0<1$ under **experimental** condition and to assess **effectiveness in field trials** taking into account regional differences

- The development of **mass applicable** AI vaccines
- The **rapidly update** if required based on the antigenic match; for this purpose, continuous surveillance efforts to **monitor virus evolution** are needed

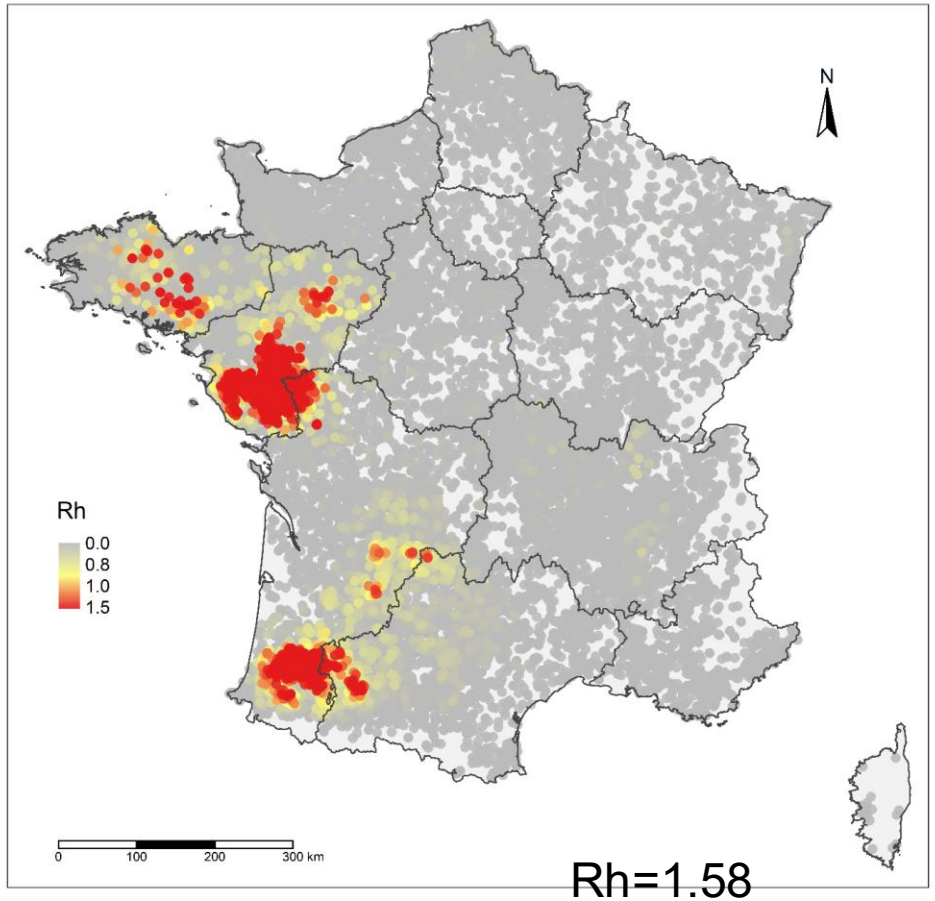
# TOR 2 – VACCINATION STRATEGIES

# TOR 2 – VACCINATION SCENARIOS

| | |
|---|---|
| **Scenario 0 (S0)** | **No vaccination**<br>Culling in all infected poultry farms |
| **Scenario 1 (S1)** | **No vaccination**<br>Culling in all infected poultry farms<br>Preventive ring **culling** in all poultry farms within **1-km** radius of infected poultry farms |

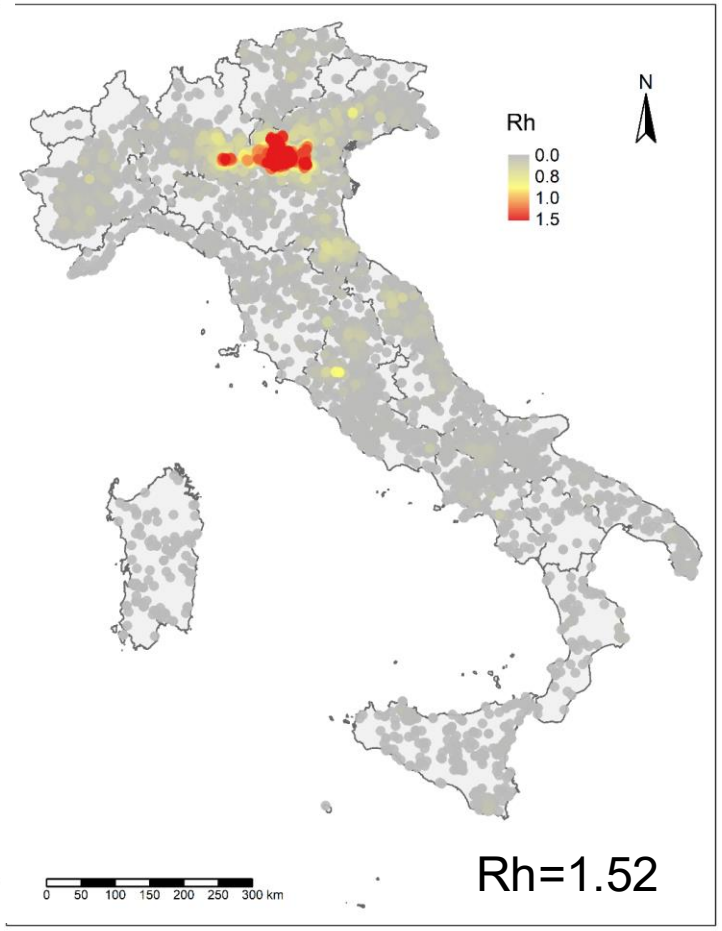
# TOR 2 – TRANSMISSION MAPS

Rh are the between-farm reproduction numbers quantified using the kernel. Areas where Rh > 0.8 are considered high-risk areas for transmission



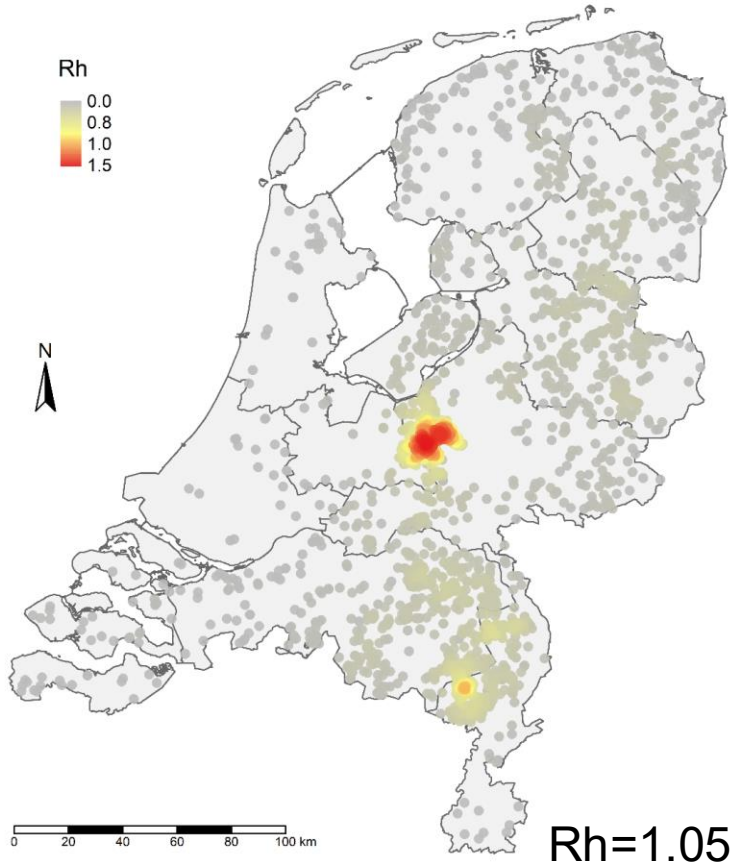

Rh=1.58

(farm density > 0.54 farm/km2)




Rh=1.52

(farm density > 0.52 farm/km2)

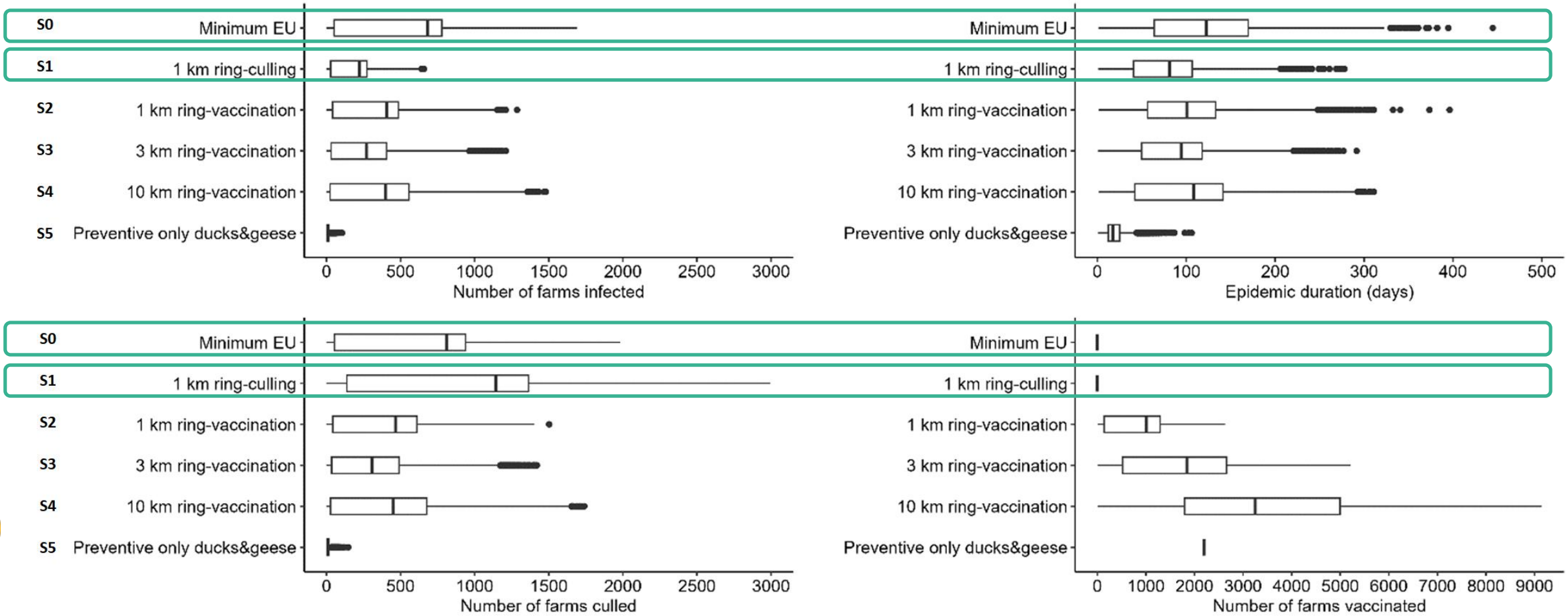



Rh=1.05

(farm density > 0.84 farm/km2)

# TOR 2 – VACCINATION SCENARIOS

Results from the model simulation for each scenario in **France**



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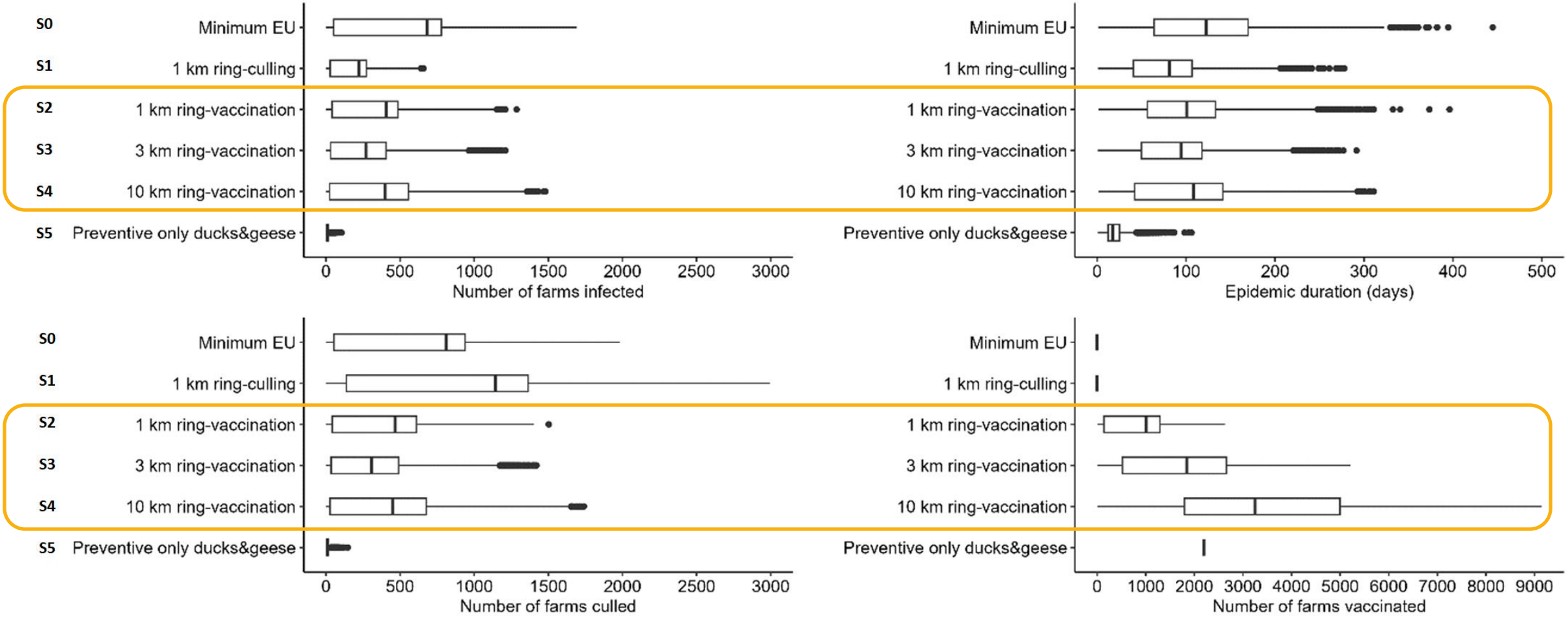

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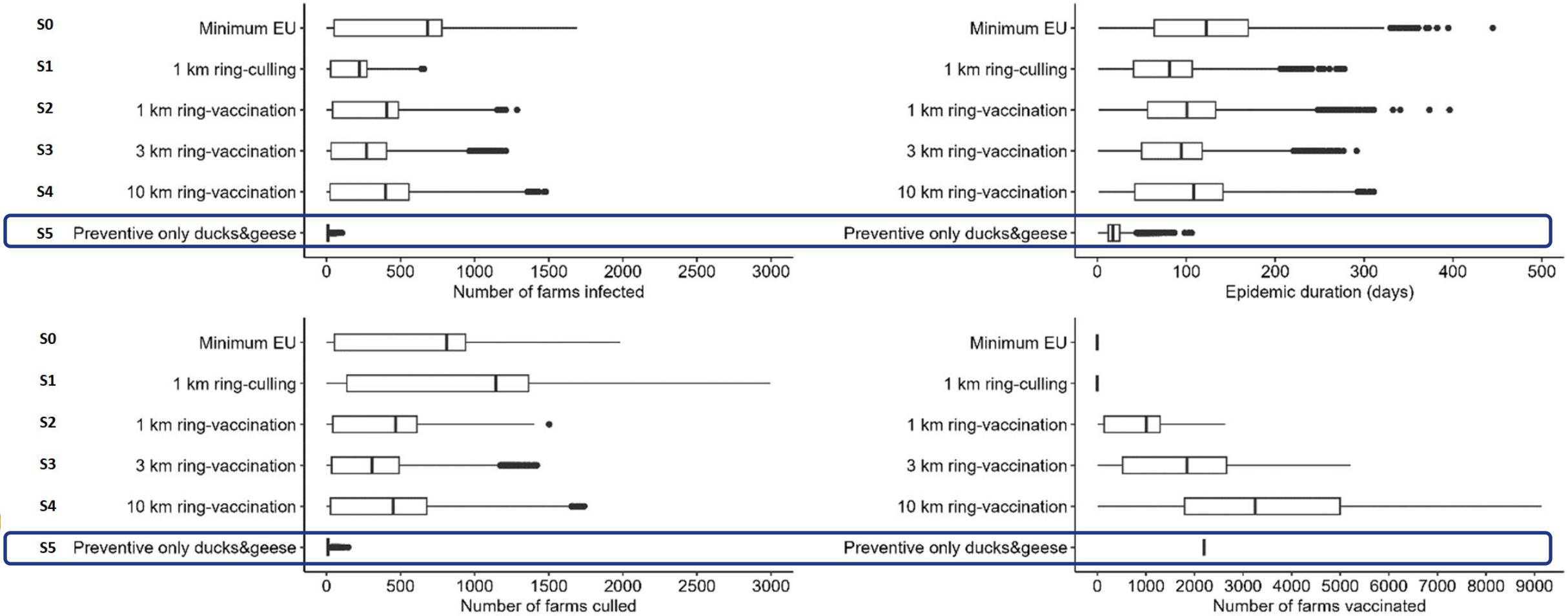

# TOR 2 – RECOMMENDATIONS

- To minimise the number of infected and culled farms and epidemic duration, **preventive vaccination of the most susceptible and/or infectious poultry species is recommended** in high-risk transmission areas. Depending on the region, these species are ducks, geese, turkeys and layers chickens
- In case of an outbreak in a high-risk transmission area, **emergency protective vaccination in a 3-km radius is recommended**, as it showed to be the most effective strategy among the three emergency vaccination scenarios tested
- **Monitoring of vaccine efficacy over time** should be planned under the implementation of every vaccination strategy, due to possible changes in the antigenicity of circulating HPAI viruses, changes that can also be accelerated by the selection pressure exerted by vaccine-induced immunity

# THANKS TO ALL THE EXPERTS INVOLVED

## Working group experts

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## Member State

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- France
- The Netherlands

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- LANFRANCHI Barbara
- MUR Lina


Thank you for your attention!
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