

# Risk assessment of Swine influenza in pig farms: a semi-quantitative approach

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## INTRODUCTION

Swine Influenza (SwIA) is a viral zoonotic respiratory disease of pigs that poses a threat to both animal and human health. Circulating strains in Europe derive from a genetic reassortment of human, avian and porcine strains.

Although swIA has been included by EFSA in the list of the ten priority zoonotic diseases<sup>1</sup>, surveillance around the world is very weak: experts highlight the need to implement research on risk assessment to improve surveillance.

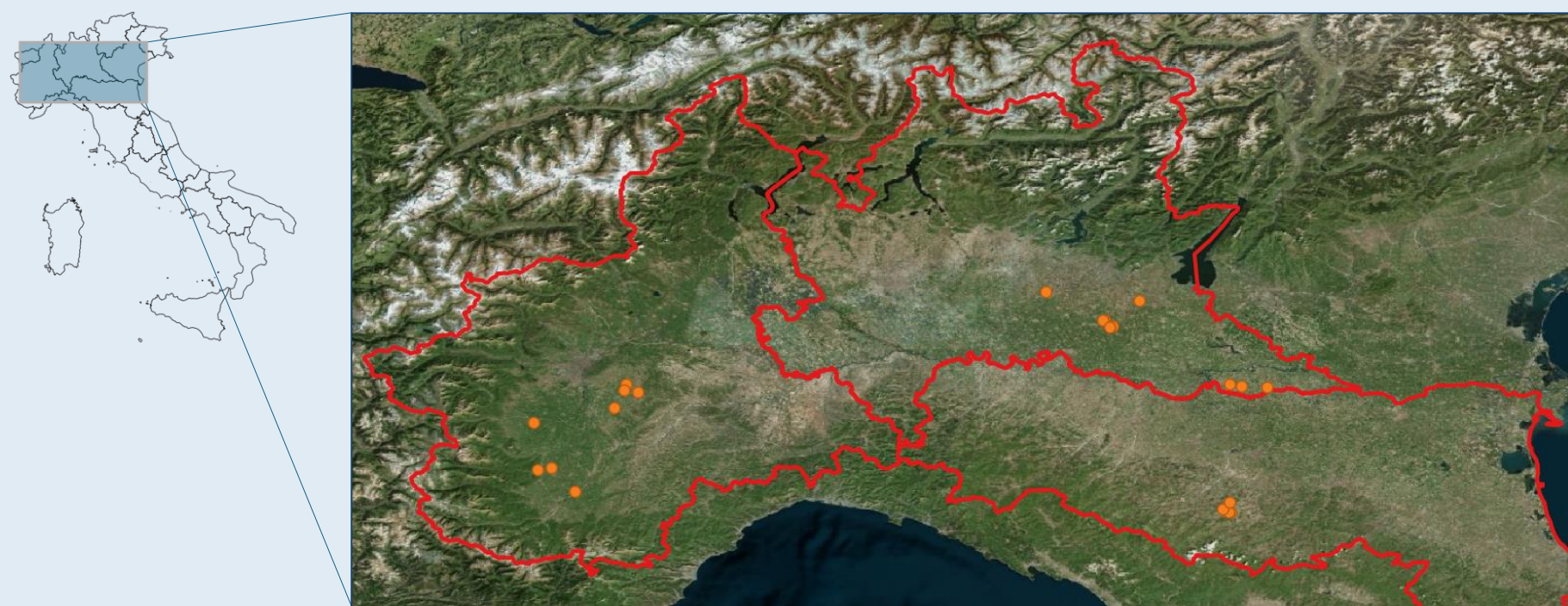
## OBJECTIVES

**Semi-quantitative risk assessment to classify:**

- **commercial pig farms** in terms of likelihood of introduction of SwIA virus (SwIAV) by evaluating the biosecurity system
- **husbandry practices** in terms of risk of workers' exposure to the virus.

## METHODS

### STUDY AREA



Piedmont, Lombardy and Emilia Romagna regions in northern Italy host more than 75% of the Italian pig population

Interviews in 22 commercial farms (●)

Different types of production (farrowing, weaning, fattening sites and from farrow to finish sites)

### DATA COLLECTION AND ANALYSIS

Data collection on:

6 **biosecurity** criteria (pathways for SwIAV introduction):

- Personnel
- Animal introduction
- Shelters management
- Animal transport
- Materials Management
- Buildings and access contro



4 indicators of the **risk of workers'** exposure during husbandry practices:

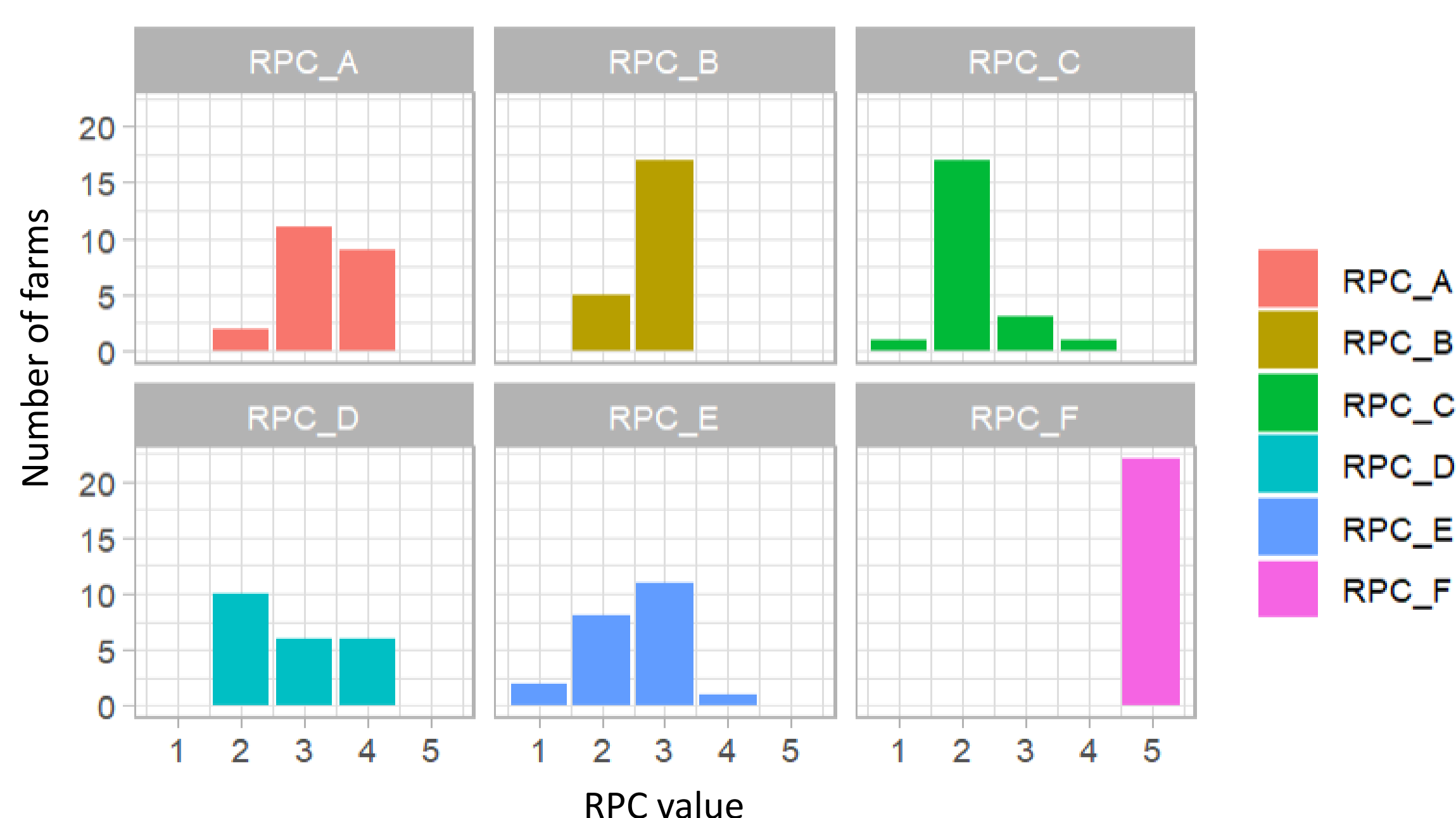
- Time spent on practice
- Use of personal protective equipments (PPE)
- Number of animals per worker
- Type of contact with pigs



Use of modified Failure mode and effect analysis (FMEA)<sup>2</sup> to calculate risk priority codes (RPCs) indicating increasing risk levels

## RESULTS

RPCs distribution across farms (1=lowest risk, 5=highest risk)



### Biosecurity criteria:

**Highest risk level** of virus introduction (RPC=5) for **criterion F** (buildings and access control) across all farms -> significant non-compliance with biosecurity measures:

- visitors can enter the farms even when showing influenza-like symptoms
- in 86% of the farms, visitors are not required to wear masks.

**Medium-high risk** (RPC=4) for **criterion A** (personnel) for 41% of farms:

- all farms required personnel to change footwear/clothing
- 22% lacked clear separation between clean and dirty areas
- just 14% required workers to wear masks, which are important for preventing viral exchange between pigs and humans.

**Medium-low risk** (RPC=2) for **criterion C** (shelter management) for most farms, reflecting good biosecurity measures such as:

- quarantine periods
- management of the all-in-all-out system
- cleaning/disinfection protocols.

### Husbandry practices:

150 records grouped into 14 practices (RPC1=lowest risk, 4=highest risk)

- Medium-low risk of workers' exposure (RPC=2) for most of the practices involving cleaning and disinfection procedures along with daily inspection of animals/feeding operation/ carcasses removal.
- gloves were the most common PPE used during direct contact with animals, while masks and goggles were rarely used.

## CONCLUSIONS

Biosecurity measures and good husbandry practices are among the most effective measures to prevent the disease at farm level. Identifying farms and practices with higher risk for SwIAV could help to prioritize monitoring efforts for virus circulation and define measures and recommendations to reduce workers' occupational risk.

## REFERENCES

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2. Franceschini F, Galetto M. A new approach for evaluation of risk priorities of failure modes in FMEA. Int J Prod Res. (2001) 39:2991–3002. doi: 10.1080/00207540110056162

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