

From the zoonotic risk to the economic losses: a serosurvey of ten pathogens in pig farms in the Campania region

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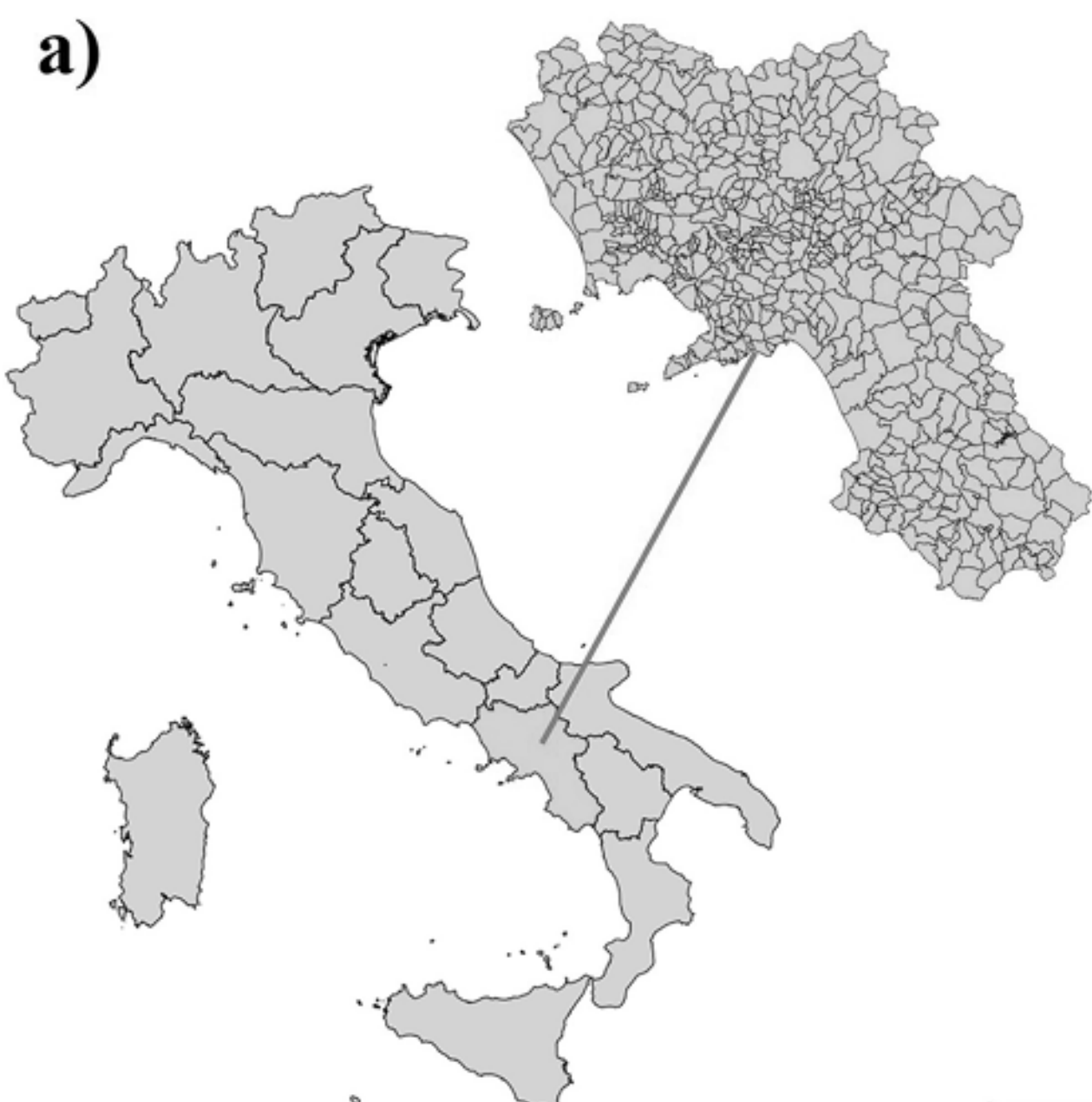
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INTRODUCTION & AIM

Pigs and wild boars (*Sus scrofa*) are susceptible to a wide range of pathogens, including viruses, bacteria, and parasites. Some of these are zootechnical impactful due to the damage they cause to the agricultural economy, others impacting public health as zoonoses. In the Campania area, pig farming is considered a minor kind of farming, second only to ruminant farming in terms of numbers. Pig farming is not commonly practiced in this region: roughly 75,000 pigs were raised, accounting for 2% of the Italian herd. In this study, the seroprevalence of 10 swine pathogens (4 zoonotic: HEV, MAP, *Brucella suis*, *Coxiella burnetii*, and 6 impacting: PEDV, PRCV, TGEV, PRRSV, BVD, and SBV) was assessed, as well as any risk factors associated with increased exposure risks.

METHOD

This survey was performed in the Campania region (410000000 N-143000000 E), southern Italy. A total of 438 blood samples from unvaccinated farms were collected. The presence of antibodies against porcine CoVs was determined using three commercial ELISAs: INgezim® TGEV, INgezim® PEDV and INgezim® Differential coronavirus (Eurofins Ingenasa, Madrid, Spain. The presence of antibodies against PRRSV was determined using a commercial kit, (INgezim® PRRS Universal, Eurofins Ingenasa, Madrid, Spain). Six commercial and multispecies ELISAs were used to assess the detection of antibodies against BVDV, SBV, *Coxiella*, HEV, M-avium, B.suis: ID Screen® BVD p80 Antibody Competition, ID Screen® Schmallenberg virus Competition Multi-species, ID Screen® Q Fever Indirect Multi-species, ID Screen® Hepatitis E Indirect Multi-species, ID Screen® *Mycobacterium avium* Indirect Multi-species, and ID Screen® *Brucella suis* Indirect (Innovative diagnostics, IDvet). All kits were used exactly as the manufacturers instructed. Optical density was measured with a spectrometer.



RESULTS & DISCUSSION

The greatest seroprevalences were found for hepatitis E virus (HEV, 41.4%), porcine reproductive and respiratory virus (PRRSV, 16.7%), and porcine epidemic diarrhea virus (PEDV, 14.8%). Lower prevalences were identified for transmissible gastroenteritis (TGEV, 5.5%), pig respiratory coronavirus (PRCV, 0.9%), *Mycobacterium avium* paratuberculosis (MAP, 3.5%), bovine viral diarrhea virus (BVDV, 3%), Schmallenberg virus (SBV, 5.3%), and *Coxiella burnetii* (4.1%). No animals had antibodies against *Brucella suis*. On the herd level, we discovered a prevalence of 50% (16/32) for PRRSV, PEDV 68.7 (22/32), TGEV 6.6% (2/32), PRCV 6.2 (2/32), SBV 31.2 (10/32), *Coxiella burnetii* 34.4% (11/32), BVD 18.75 (6/32), HEV 83.8% (26/31), B.suis (0%), and M.avium 32.3% (10/31). Furthermore, statistical testing revealed a link between sex, age, and farm type with increased exposure to HEV, SBV, PEDV, and TGEV. CoVs have been identified in intensive farms at a rate of 18.2%, with PEDV at 7.2%. SBV A further multivariate analysis (logistic regression) revealed the considerably increased exposure for female and mature animals. Age and sex were also linked with greater HEV seroprevalences.

Agent	Individual %	Farm %
PRRSV	16.7 (73/438)	50 (16/32)
PEDV	14.8 (65/438)	68.7 (22/32)
TGEV	5.5 (24/438)	6.2 (2/32)
PRCV	0.9 (4/438)	6.2 (2/32)
SBV	5.3 (22/414)	31.2 (10/32)
<i>Coxiella burnetii</i>	4.1 (17/414)	34.4 (11/32)
BVD	3 (12/414)	18.75 (6/32)
Hepatitis E virus	41.4 (153/370)	83.8 (26/31)
<i>Brucella suis</i>	0 (0/370)	0 (0/31)
<i>Mycobacterium avium</i>	3.5 (13/370)	32.3 (10/31)

CONCLUSION

In the study area, exposure to pathogens causing damage to the swine industry economy, such as PRRSV and PEDV, as well as to those with zoonotic potential, such as *Coxiella* and HEV, was frequent. The results of this study underline the importance of continuous surveillance in swine farming in order to understand the main circulating pathogens, risk factors, and measures to be taken. These data highlighted which zoonoses to focus on in subsequent studies and surveillance plans.

FUTURE WORK / REFERENCES

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