



Enhancing African swine fever control strategies in South Africa: Contributions to disease introduction and spread by smallholder pig farmers

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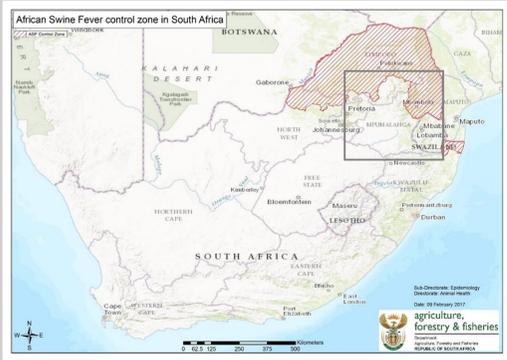


Figure 1 | Map of Mpumalanga Province in relation to South Africa's African swine fever control zone (DAFF 2017)

In 1935 South Africa established a historically effective ASF control zone (Fig. 1), delineated by the habitat range of ASF virus sylvatic hosts (warthogs) and vectors (soft ticks). Since 2012, the number and intensity of ASF epidemics beyond the control zone have increased alarmingly. The evidence indicates an **emergent pig-pig transmission cycle driven by high-risk management practices**, often associated with **resource-poor production systems** is responsible (Janse van Rensburg et al. 2020). Currently, local ASF transmission dynamics remain poorly understood, vet services continue to be overwhelmed, data are scarce, and risks remain unquantified.

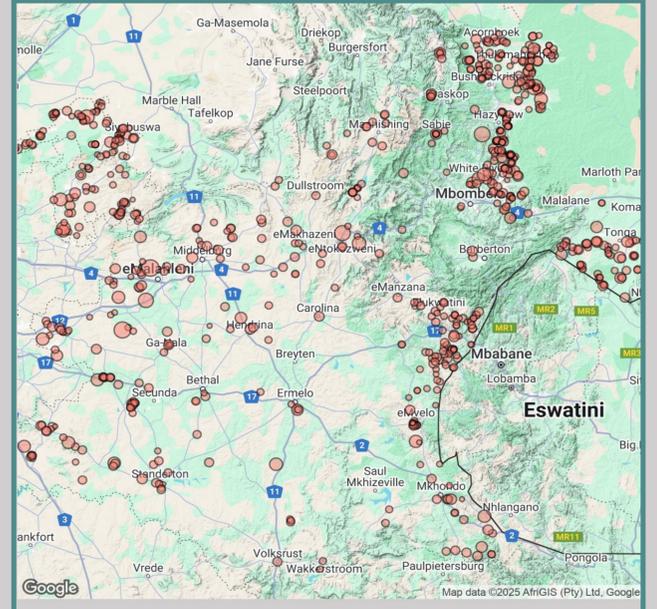
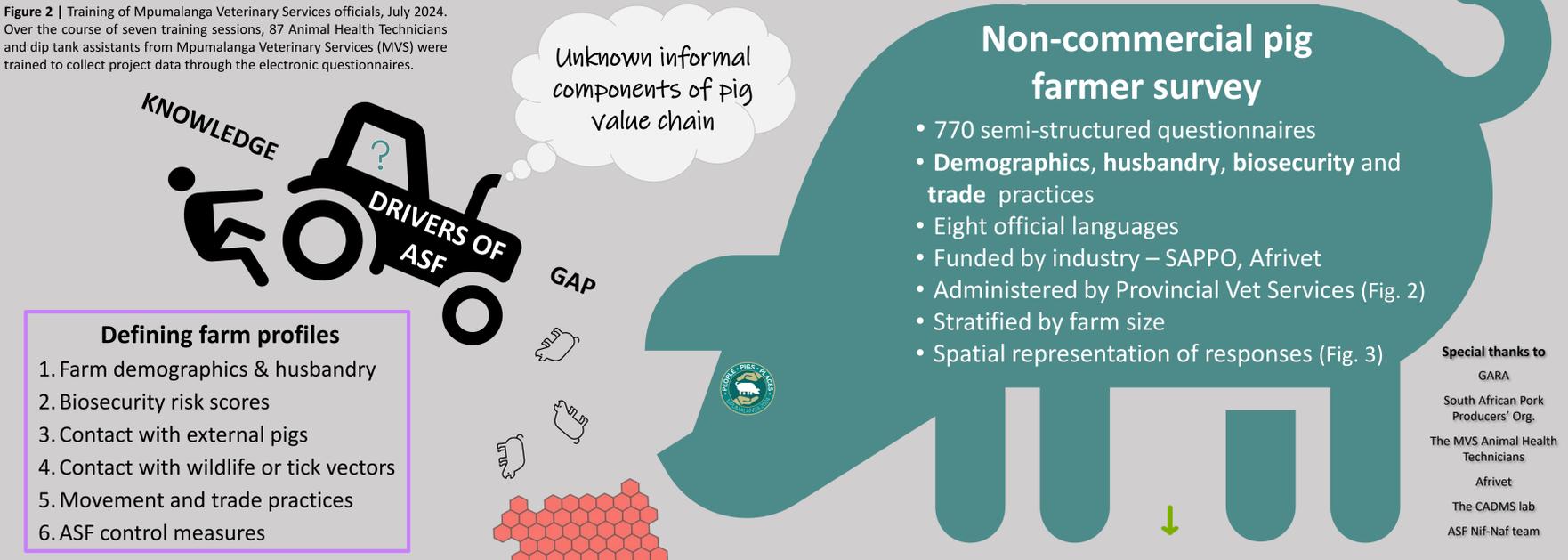


Figure 3 | Map of 770 questionnaires administered to non-commercial pig owners in Mpumalanga from July to December 2024 by farm size

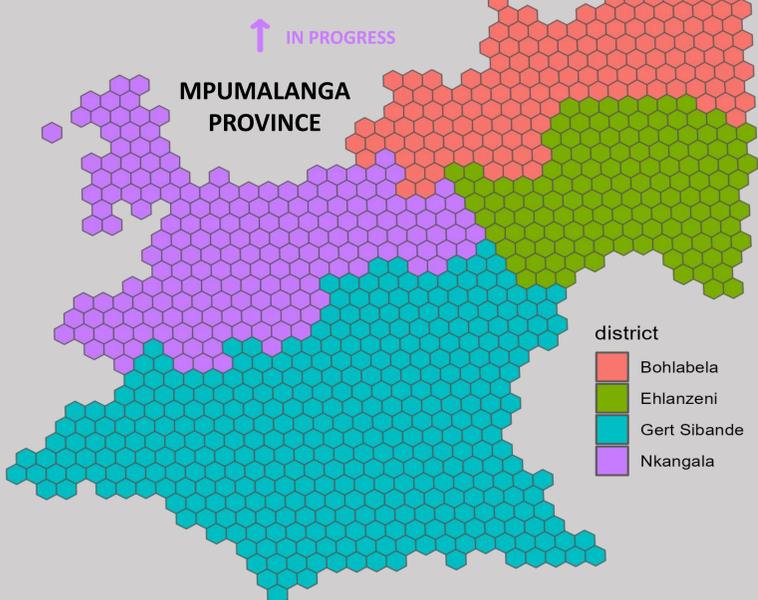


Figure 2 | Training of Mpumalanga Veterinary Services officials, July 2024. Over the course of seven training sessions, 87 Animal Health Technicians and dip tank assistants from Mpumalanga Veterinary Services (MVS) were trained to collect project data through the electronic questionnaires.

This study aims to address knowledge gaps relating to small-scale pig farm demographics, production practices and trade, to determine the contribution of these variables to the pig value chain.



- ### Defining farm profiles
1. Farm demographics & husbandry
 2. Biosecurity risk scores
 3. Contact with external pigs
 4. Contact with wildlife or tick vectors
 5. Movement and trade practices
 6. ASF control measures



Risk-based biosecurity scoring for ASF introduction and transmission

Thirty-three questions from the survey were selected to contribute to risk-based biosecurity scoring. Farm scores were calculated as non-weighted linear combinations out of a potential score of 33. 'Not risk' answers were assigned a score of zero, 'risk' answers were assigned a score of one. Missing values were scored as a zero.

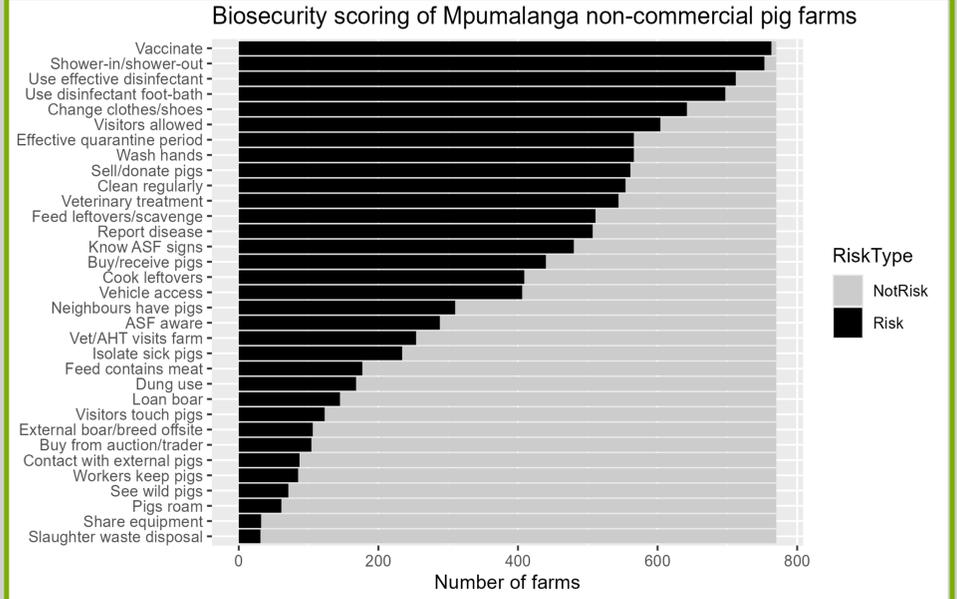


Figure 4 | Dichotomous scoring responses for questionnaire administered to Mpumalanga non-commercial pig farmers between July and December 2024, characterizing reported practices as no/low risk versus contributing risk for ASF introduction and transmission based on biosecurity characteristics. Individual farm biosecurity scores ranged from 5 to 27, with a median score of 15.

- ### Key areas identified for intervention
- Improve ASF awareness and knowledge through extension services
 - 63% had heard of ASF
 - 38% knew some clinical signs
 - Strongly recommend the cooking/boiling of leftovers/meat scraps before feeding
 - 66% feed leftovers (16% cooked)
 - 23% feed meat scraps
 - Encourage reporting of animal diseases
 - 34% currently report disease
 - Improve basic farm biosecurity (from current)
 1. Effective disinfectant use (7.5%)
 2. Use of disinfectant footbath (10.5%)
 3. Dedicated clothing/footwear (16.6%)
 4. Not allowing visitors to access the farm (21.6%)
 5. Quarantine of new pigs for ≥ 14 days (26.5%)
 6. Washing hands before handling pigs (26.5%)

