



On-Farm Surveillance for ASF and ASFv

Dirk Pfeiffer

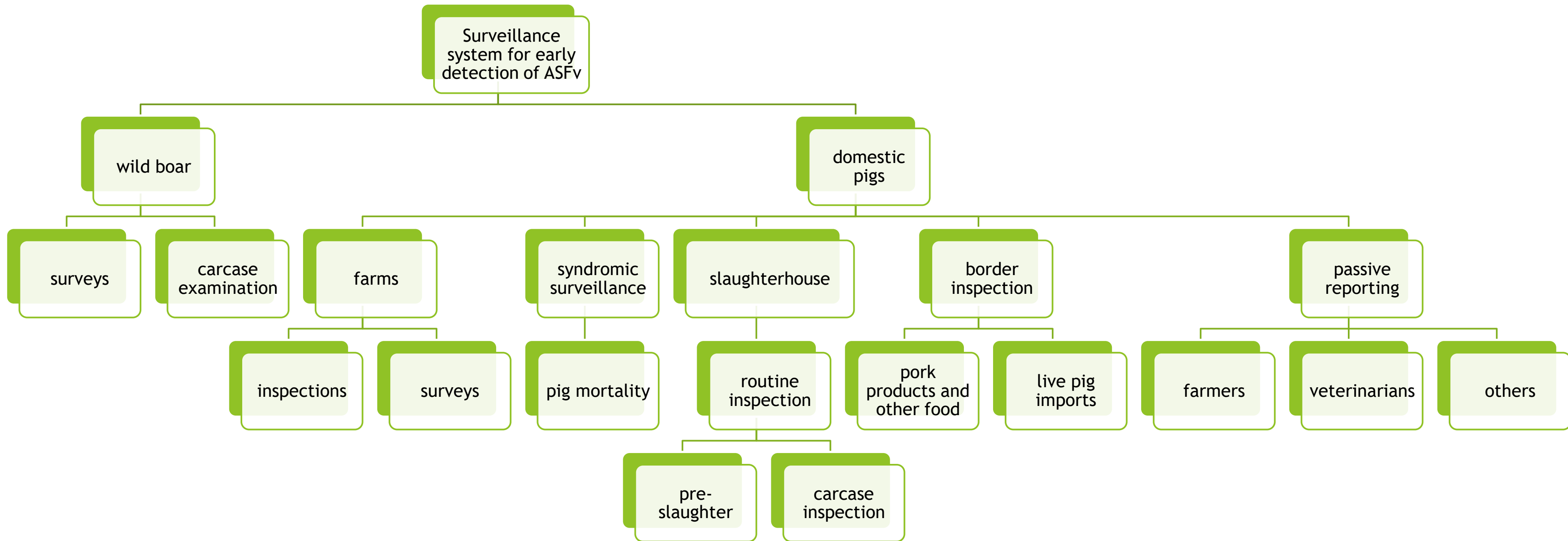
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ASF Control and Prevention Strategy

- ▶ needs to be based on objectives that are agreed amongst key stakeholders
- ▶ depends on epidemiological, pork food system characteristics and socio-economic situation
- ▶ tailored to epidemiological scenarios
 - ▶ endemic
 - ▶ new ASFV introduction
 - ▶ eradication in short-, medium and long-term
 - ▶ accepting endemicity (in low incidence situations?)
 - ▶ free from ASFV
- ▶ surveillance is a key component of strategy

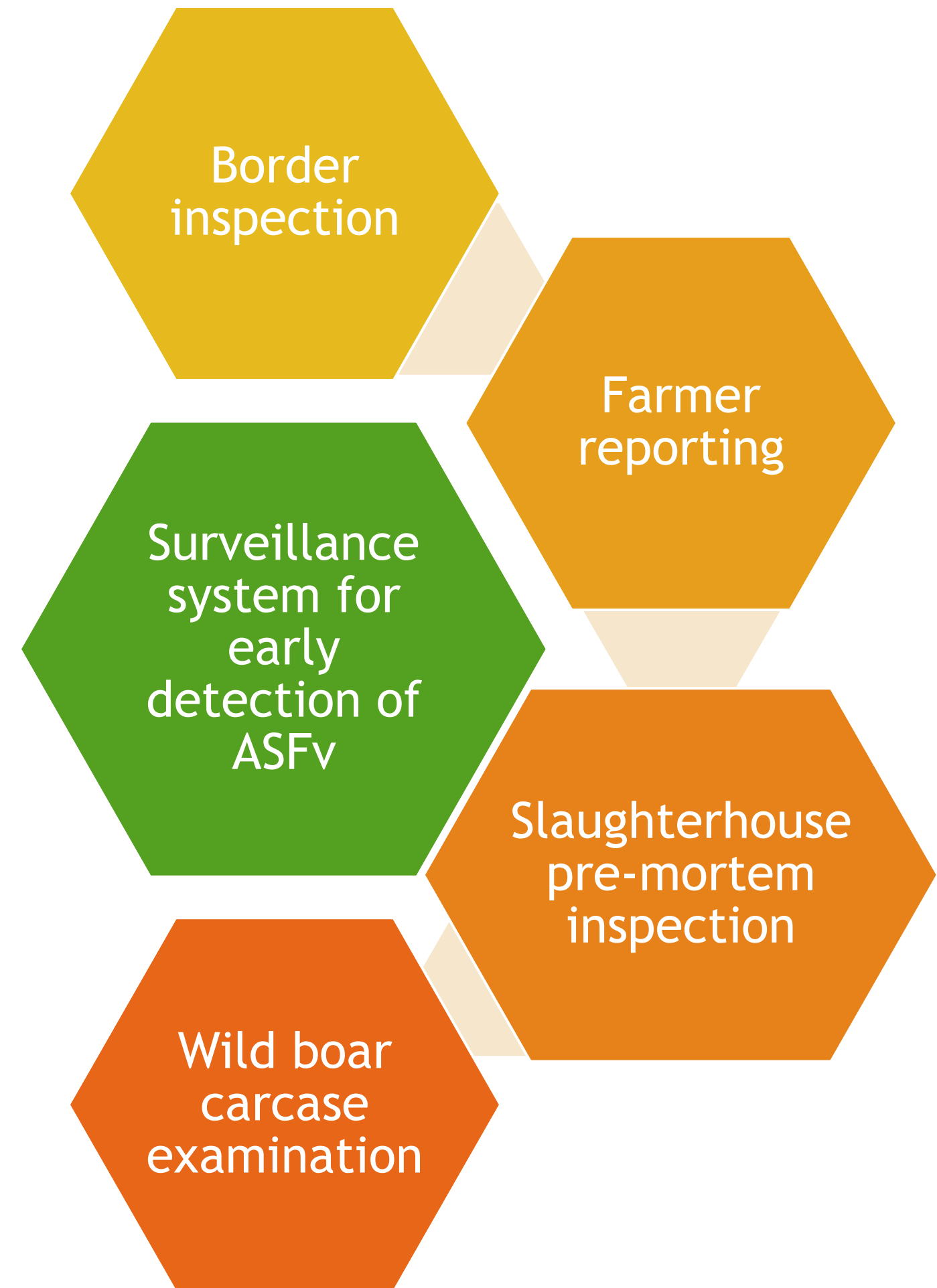
Different Potential Components of Surveillance System for ASFv



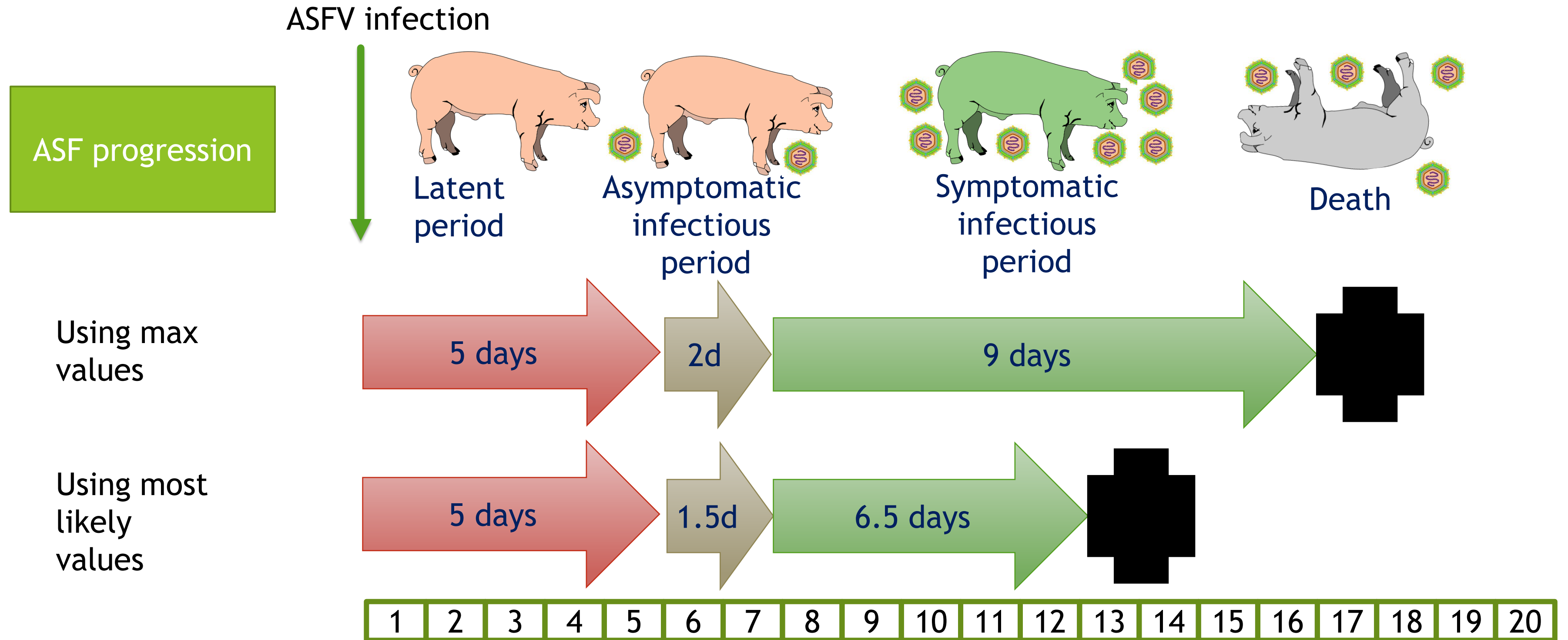
Example of Surveillance System for Early Detection of ASFv and its Surveillance System Components



Another Example of Surveillance System for Early Detection of ASFv and its Surveillance System Components

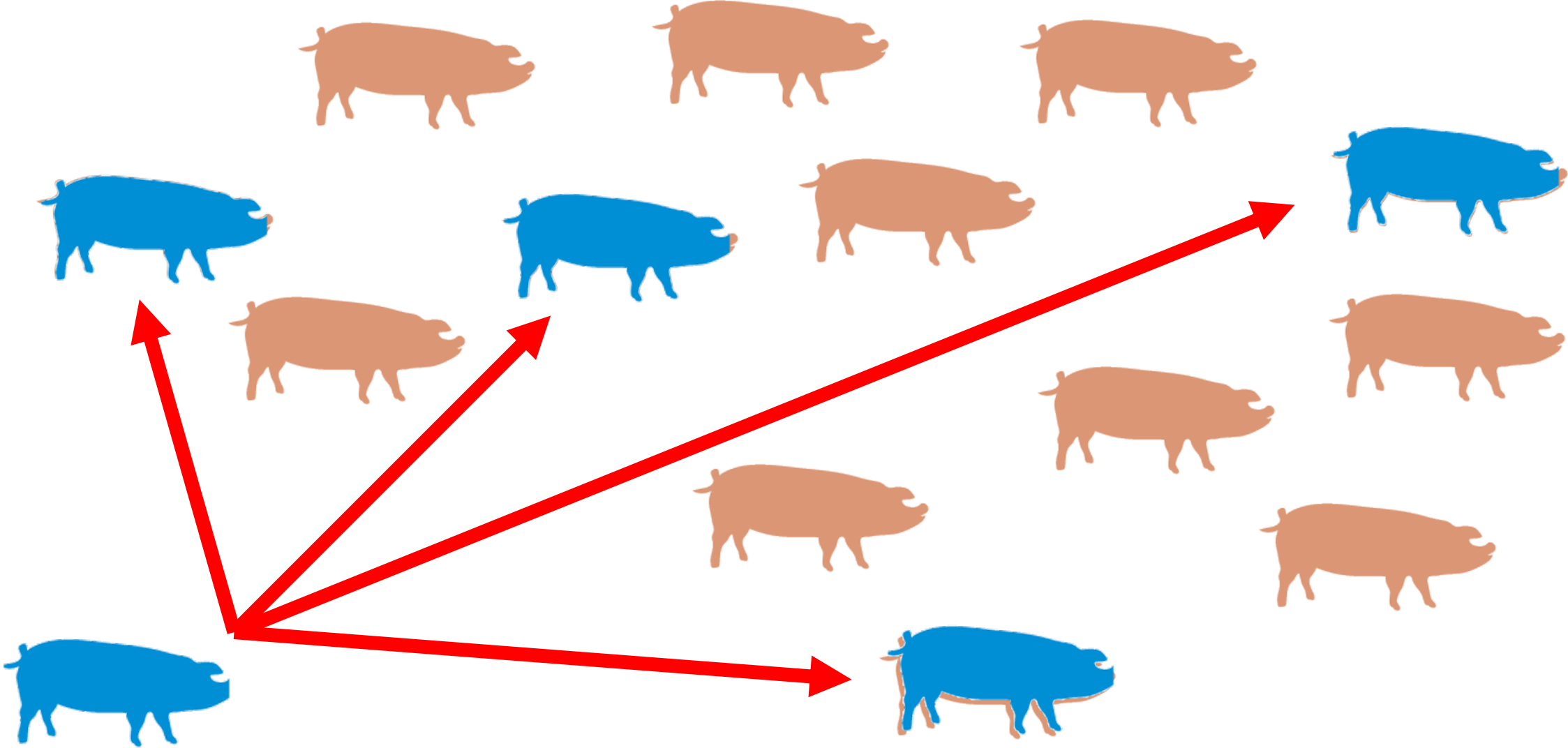


Assumptions: Infection with ASFV (Georgia 2007/1) and introduced ASFV- infected animal is infectious immediately after introduction



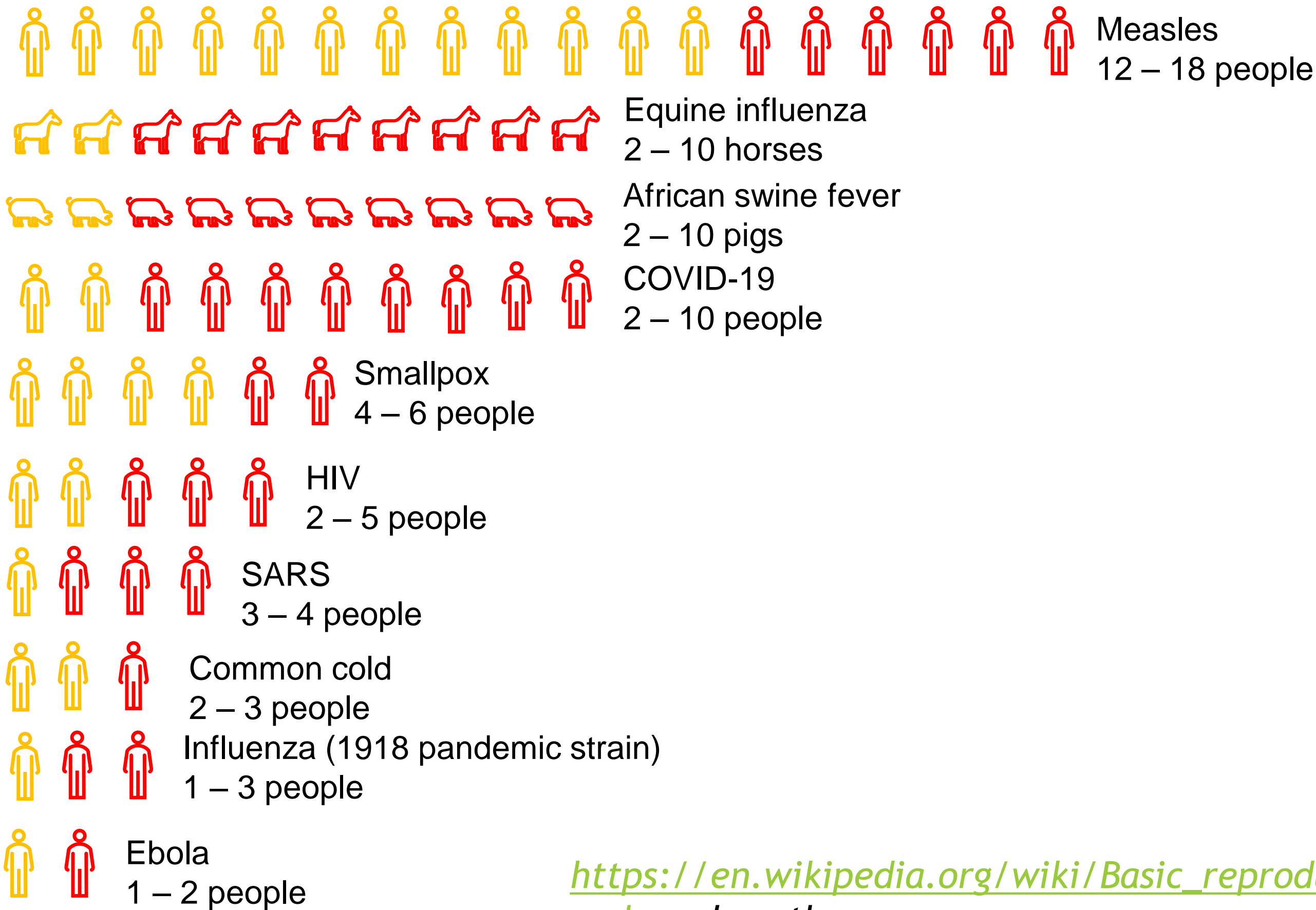
Basic Reproduction Number R_0

Average number of new cases caused by one infected individual (or farm) in a susceptible population



$R_0 = 4$

Basic Reproduction Numbers for Various Infectious Diseases

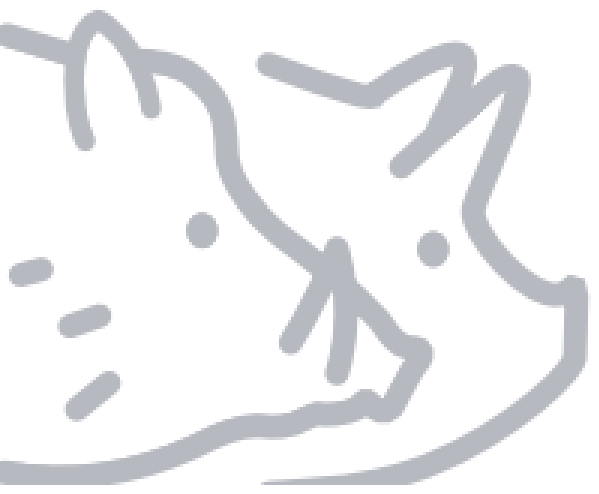


https://en.wikipedia.org/wiki/Basic_reproduction_number plus other sources



ASF Dynamics within Infected Pig Herds

- ▶ spread of ASF by pig-to-pig contact can be slower than some other diseases
 - ▶ 1-2 infected pigs introduced to group
 - ▶ initially only those 1-2 pigs die
 - ▶ 1-2 weeks for increased mortality to occur
 - ▶ minimal transmission by aerosol
 - ▶ significant virus shedding does not start before clinical signs appear
 - ▶ relatively low amounts of virus in excretions and secretions from infected pigs
 - ▶ very high amounts of virus in blood and tissues of affected pigs
 - ▶ efficient transmission through contact or consumption of carcasses of pigs or wild boar or their products



Clinical and/or Molecular Diagnostic Surveillance

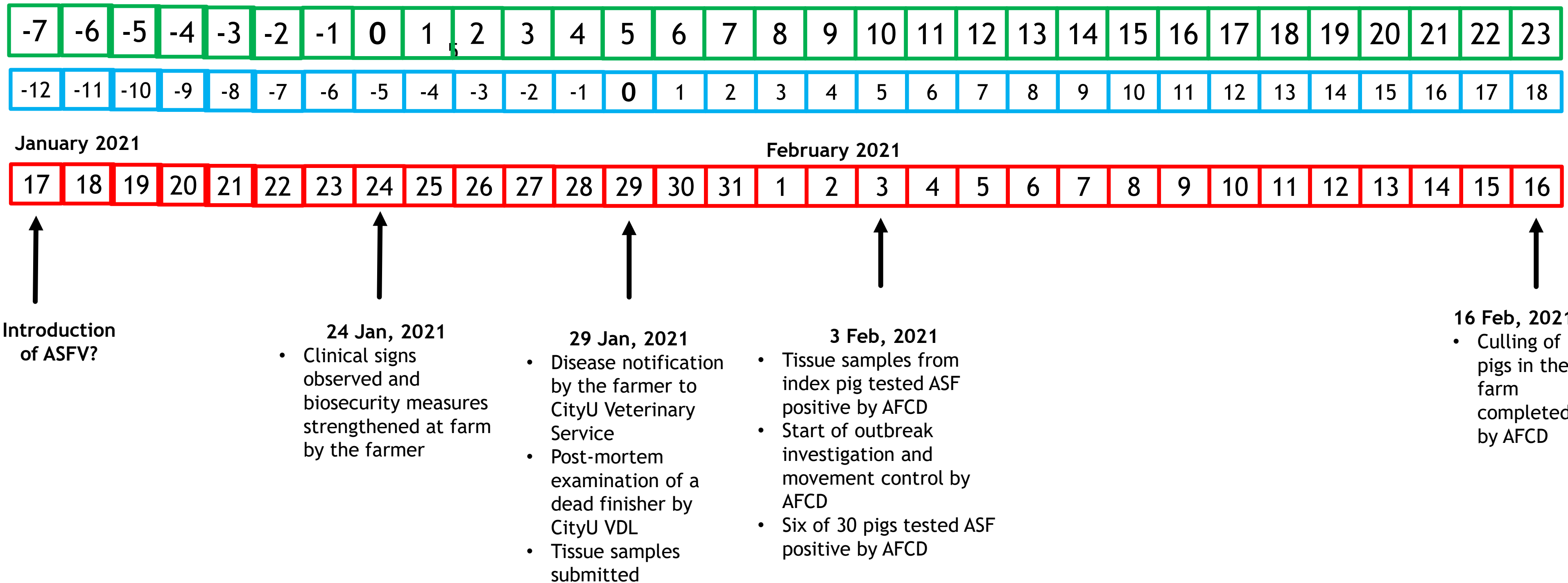
- ▶ clinical diagnosis has poor sensitivity due to delayed onset of symptoms (1 week plus, starting with mild symptoms) and mortality (2 weeks plus)
 - ▶ further compromised by reporting delays or avoidance by farmer
 - ▶ no additional cost
- ▶ molecular diagnosis through PCR has fairly high sensitivity from 5 days onwards
 - ▶ costly, only feasible on intensive commercial farms
 - ▶ need to decide 'what, when and where' to sample
 - ▶ define strategic purpose
 - ▶ precision removal strategy (still needs to be scientifically evaluated)
 - ▶ used by some very large farms in China
 - ▶ alternative to Whole Herd Culling
 - ▶ based on
 - ▶ regular whole herd PCR testing
 - ▶ removal of positive and in contact sows
 - ▶ removal of all growing pigs in same pen
 - ▶ will only work if protocols are followed meticulously



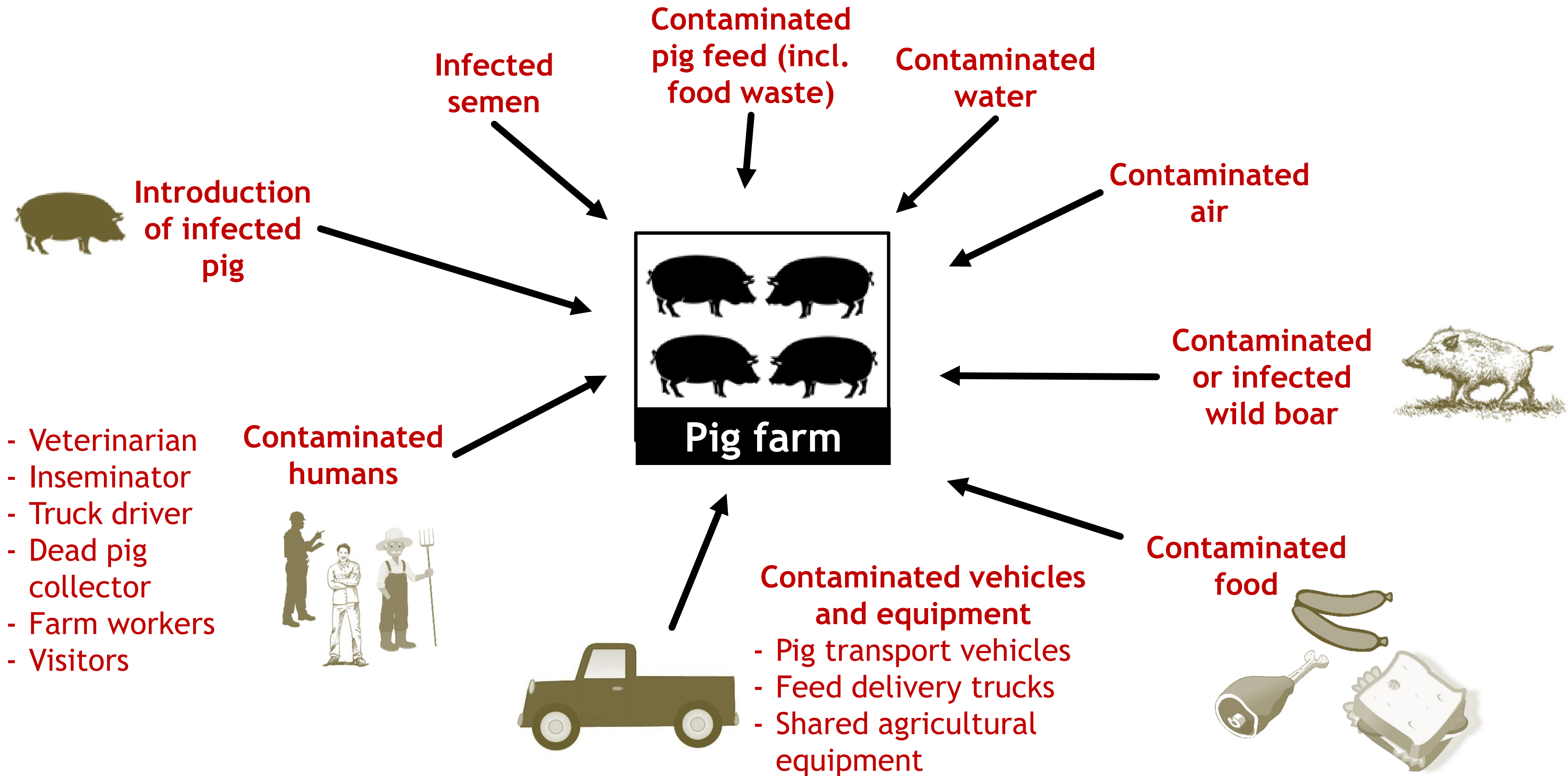
Challenges for On-farm Early Detection Surveillance based on Clinical Diagnosis

- ▶ on farms with a high 'normal' mortality level, additional mortality due to ASFV may not be noticed
 - ▶ Commercial pig production
 - ▶ In 2018, the average pig mortality during the finishing phase was 2.9% and 4.5% in the European Union and in the USA, respectively.
 - ▶ Smallholder pig production
 - ▶ Will vary enormously
- ▶ ASFV may cause smaller number of clinically affected or dying animals than expected
 - ▶ new ASF strains as a result of natural mutation
 - ▶ new strains due to illegal use of vaccine?
- ▶ need to maintain or enhance motivation of farmers to report

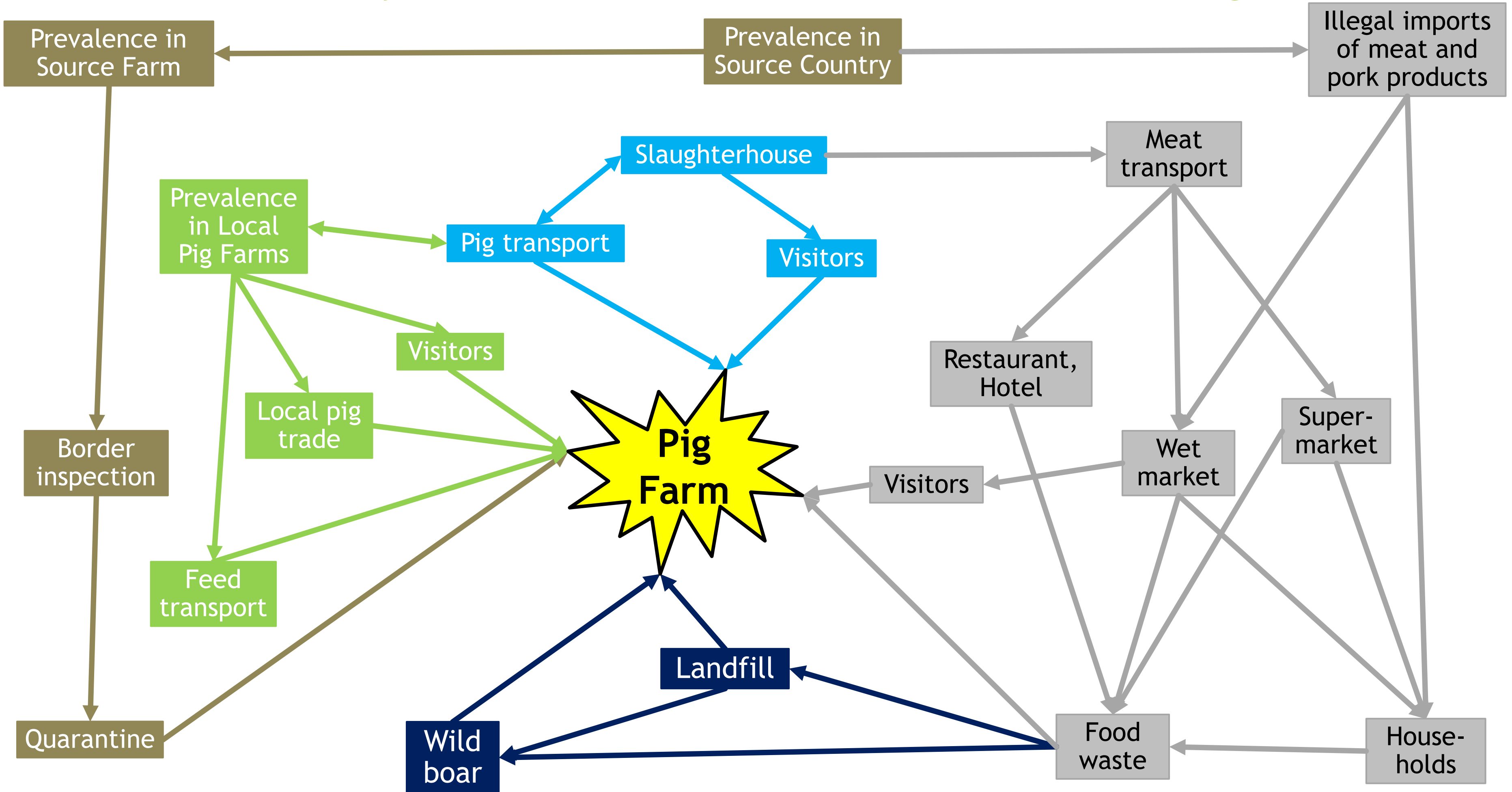
Example Case - ASF Outbreak in HK in 2021



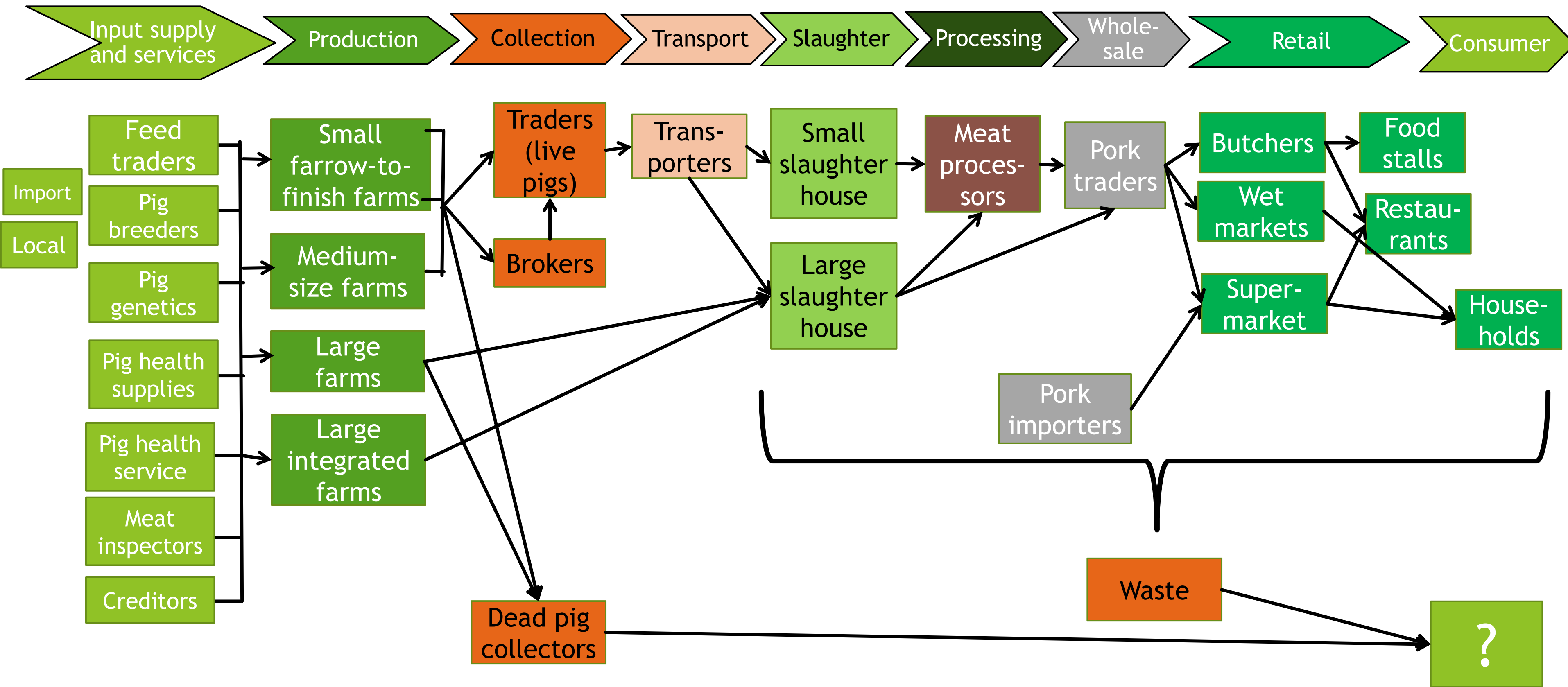
Mechanisms ASF Virus Introduction to a Pig Farm



Risk Pathways for Introduction of ASF Virus to Pig Farms



Value Chain for Pork Food System



ASF Risk Management Guidelines for Smallholder Farms in Asia

Accessible via ASF virtual learning Hub and they are currently being translated into Spanish, French and Creole.



Guidelines for African swine fever (ASF) prevention and control in smallholder pig farming in Asia

CULLING AND DISPOSAL OF PIGS IN AN ASF OUTBREAK



Guidelines for African swine fever (ASF) prevention and control in smallholder pig farming in Asia

MONITORING AND SURVEILLANCE OF AFRICAN SWINE FEVER



Guidelines for African swine fever (ASF) prevention and control in smallholder pig farming in Asia

FARM BIOSECURITY, SLAUGHTERING AND RESTOCKING



Guidelines for African swine fever (ASF) prevention and control in smallholder pig farming in Asia

CLEAN CHAIN APPROACH FOR ASF IN SMALLHOLDER SETTING



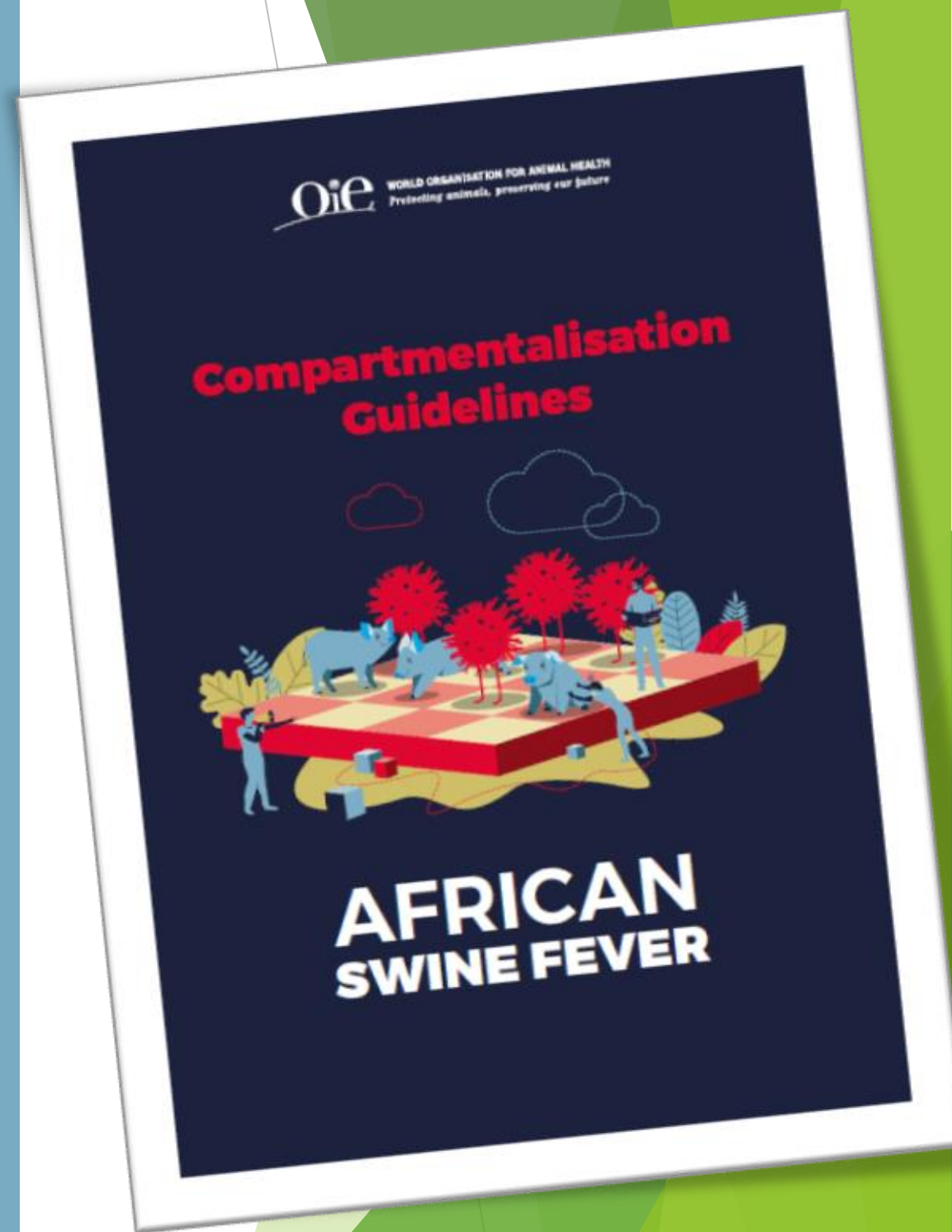
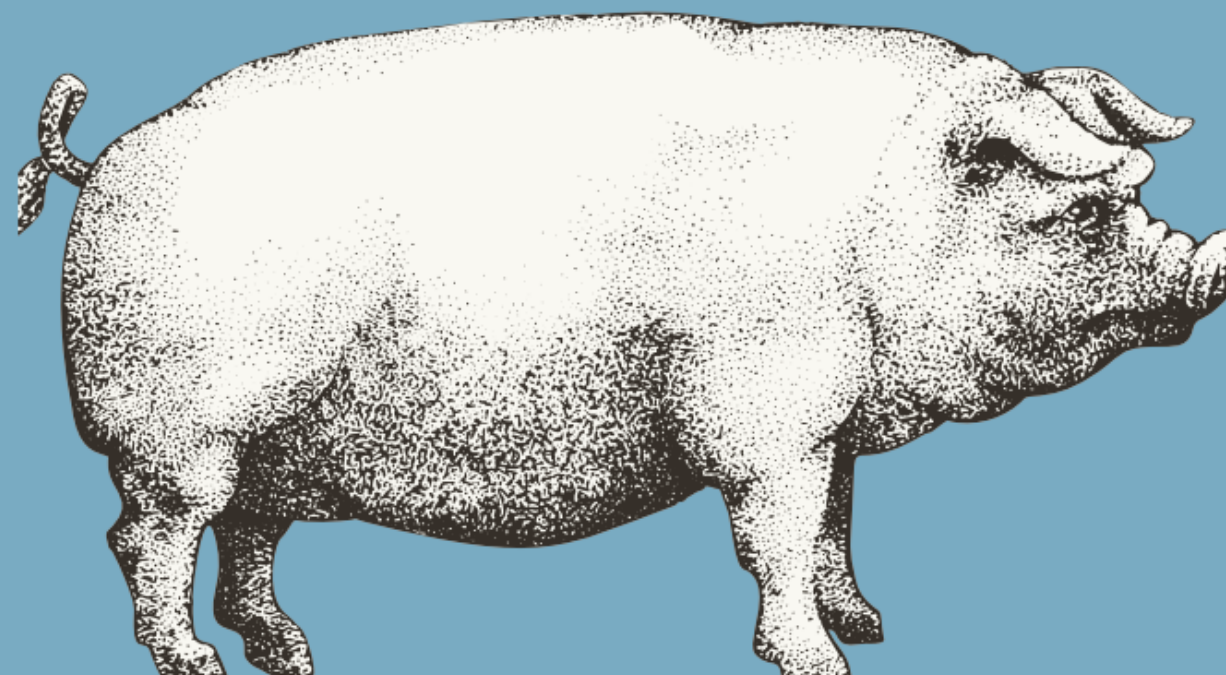


https://rr-asia.oie.int/wp-content/uploads/2022/02/asf-risk-assessment-manual_22feb2022.pdf

<https://rr-asia.oie.int/en/events/asf-cross-border-risk-assessment-in-sea-webinar/>

AFRICAN SWINE FEVER

CROSS-BORDER RISK
ASSESSMENT MANUAL:
SOUTH-EAST ASIA





Conclusions

- ▶ need clear objectives for surveillance programme
 - ▶ surveillance needs to be about informing 'action'
 - ▶ eradicate to regain freedom from ASFV (country, province, farm ...)
 - ▶ accept endemicity, but aim to slow down spread
 - ▶ in future, inform vaccination strategies?
- ▶ on-farm surveillance is part of overall surveillance programme
 - ▶ be aware of fairly long latent period
 - ▶ clinical disease surveillance has poor sensitivity
 - ▶ need support of farmers
 - ▶ incentives to report
 - ▶ potential role of on-farm molecular surveillance
 - ▶ need to evaluate utility for different purposes
 - ▶ controlling spread within farms (early detection to prevent spread to other production sections)
 - ▶ clearing infection from farms, production sections within farms



THANK YOU

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