Emergency preparedness and response to peste des petits ruminants (PPR) and Sheep and Goat Pox (SGP) in the region

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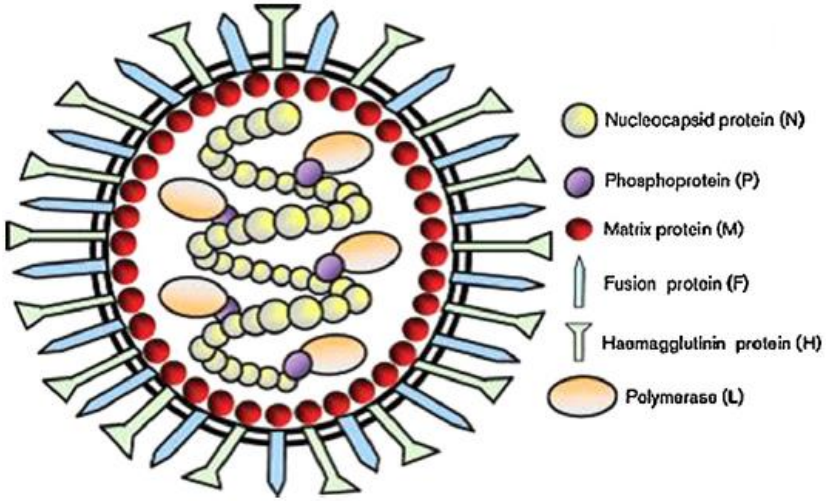


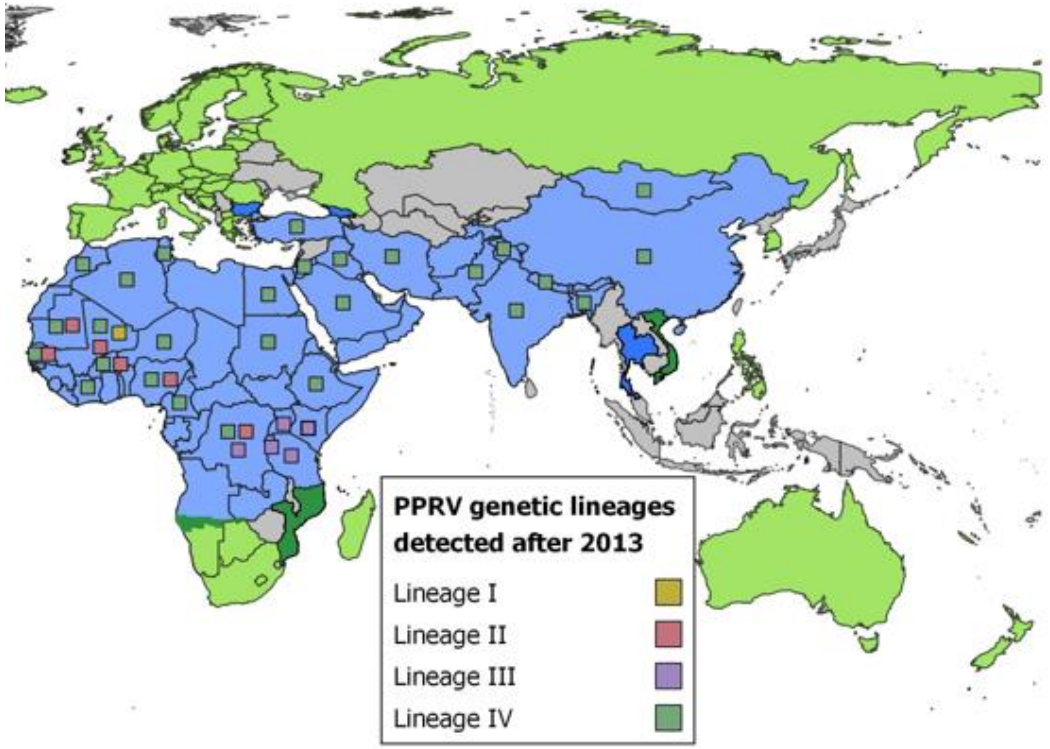
World Organisation for Animal Health

Background and consideration points - PPR

Peste des petits ruminants (PPR)

- RNA virus (morbillivirus)
  - Four genetic lineages
  - One serotype
- Transmitted mostly by contact
- Spread associated to animal movement
- No carrier or reservoir identified
- Mortality
  - Up to 100% in naïve populations
  - > 15% in endemic regions or in animals in good conditions

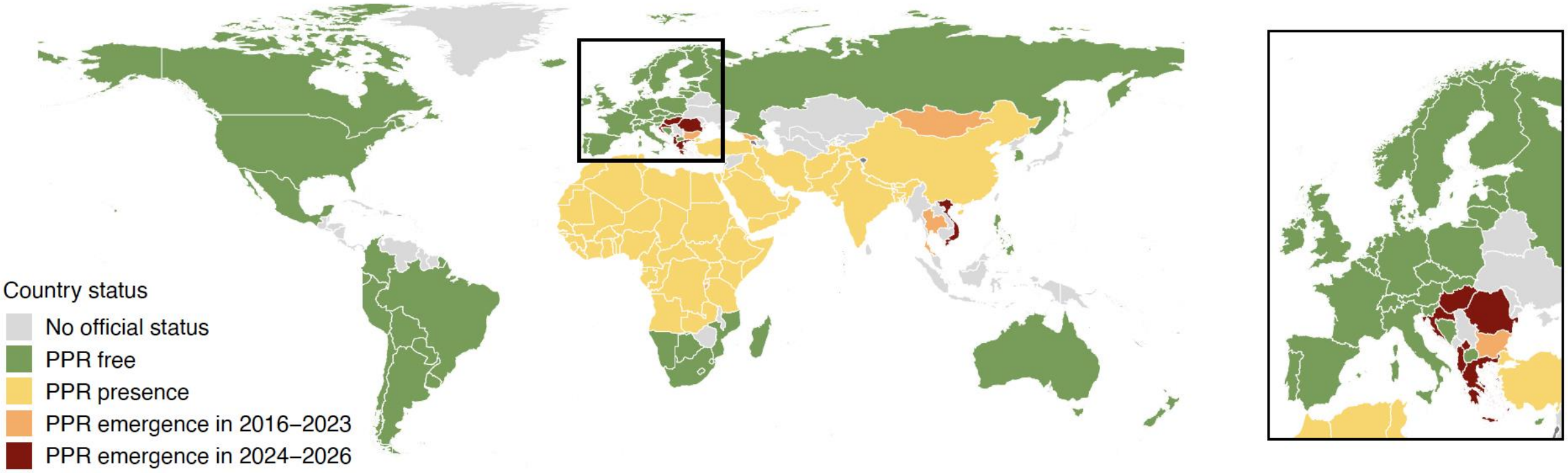




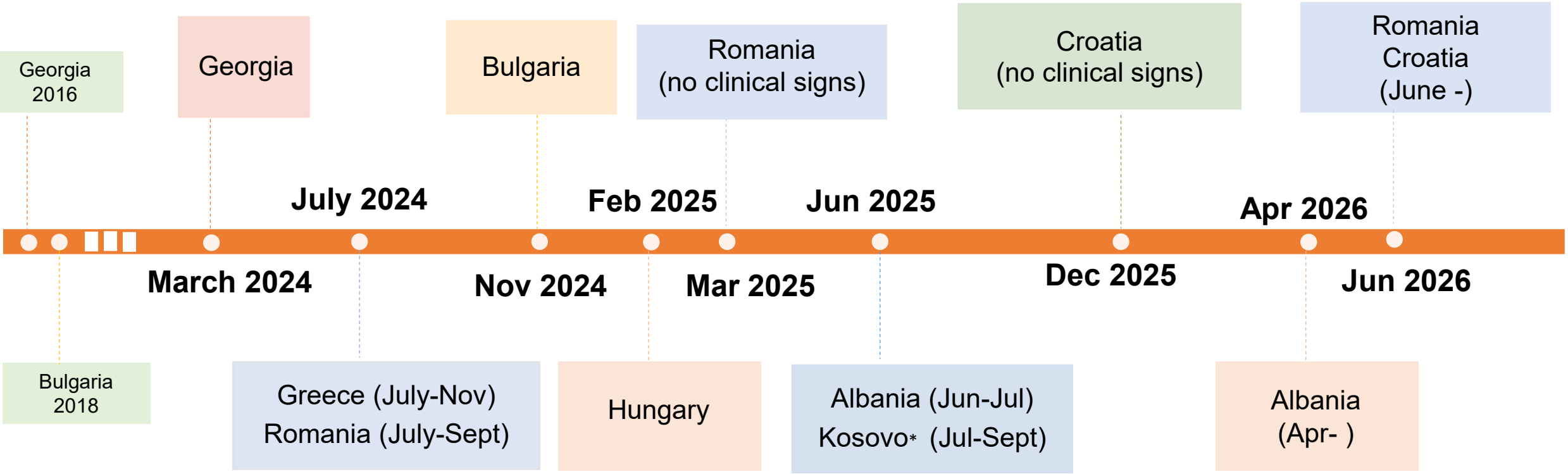
Background and consideration points - PPR

PPR global eradication programme

- Led by WOAH and FAO since 2015
- New emergences despite efforts



Chronology of events - PPR



** References to Kosovo shall be understood to be in the context of Security Council resolution 1244 (1999)*

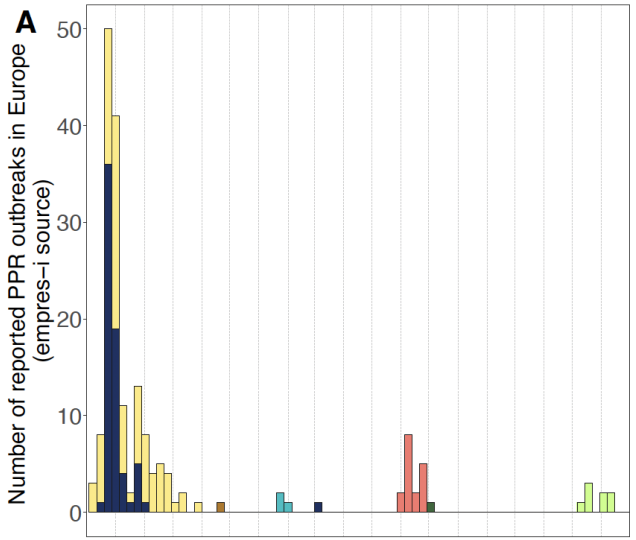
Insights from field and genetic investigations - PPR

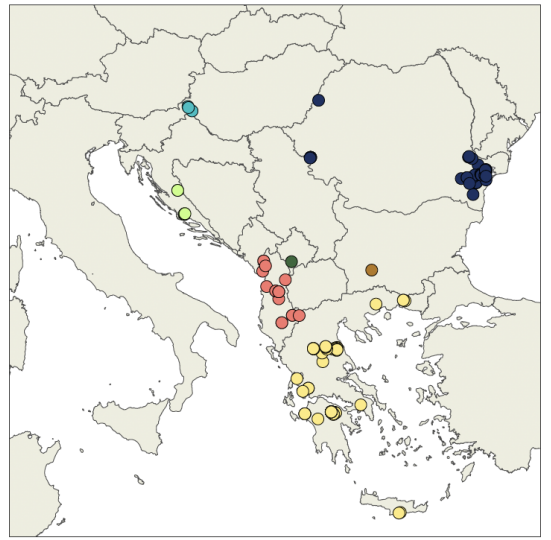
Peste des petits ruminants

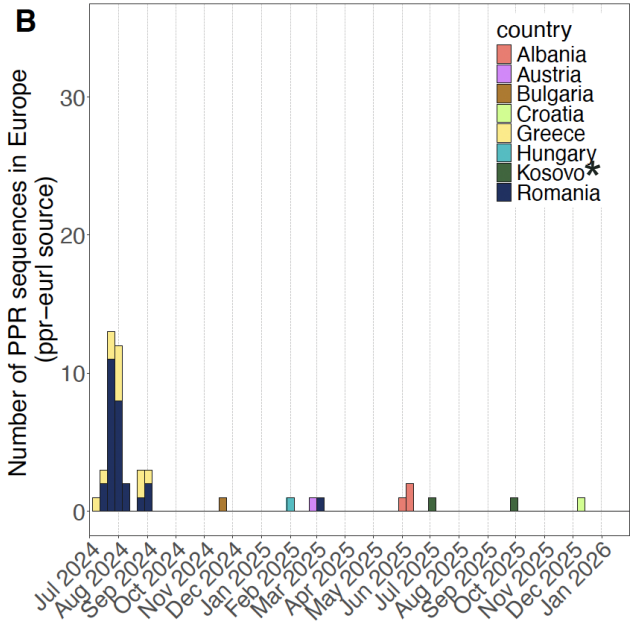
- Virus sequence analyses on PPR samples collected in 2024 and 2025

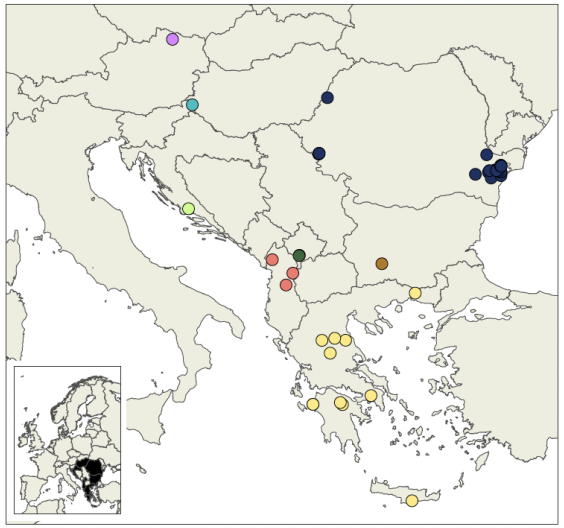
46 sequences, 8 countries incl. Austria (quarantine case)

→ spatio-temporal coverage mirrors reported outbreaks









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Insights from field and genetic investigations - PPR

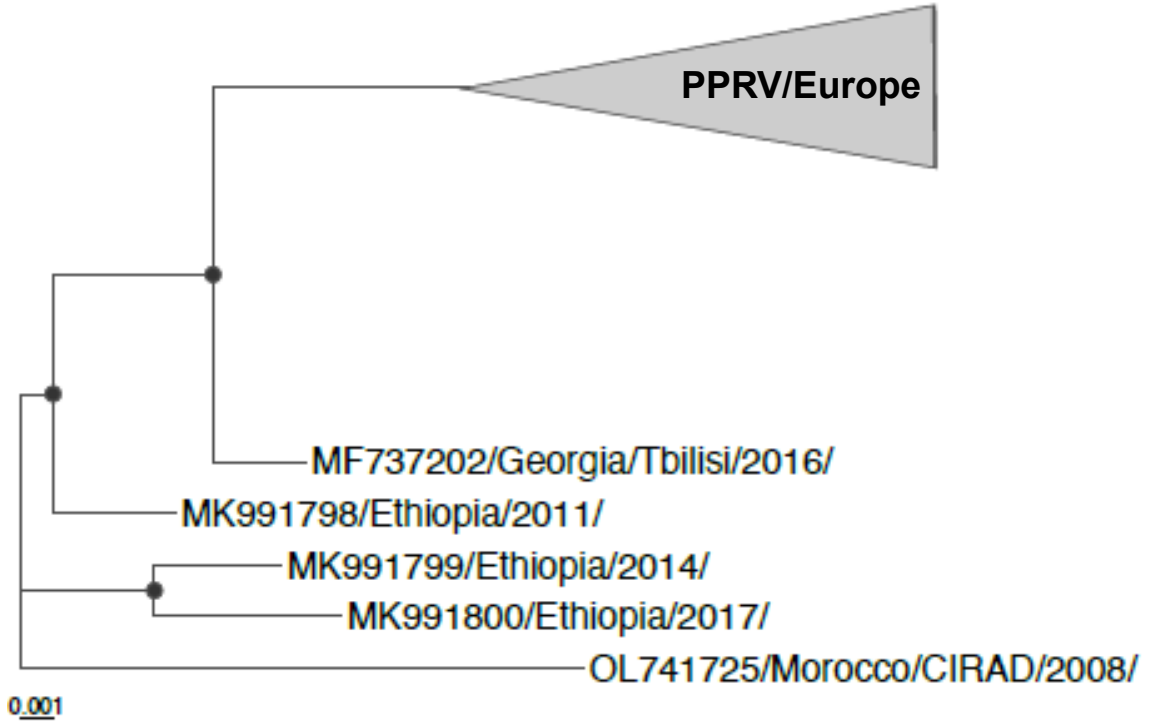
Peste des petits ruminants

- Virus sequence analyses

Common origin

Closely related to strains in North and the Horn of Africa

Continuous circulation since first introduction



Insights from field and genetic investigations - PPR

Peste des petits ruminants

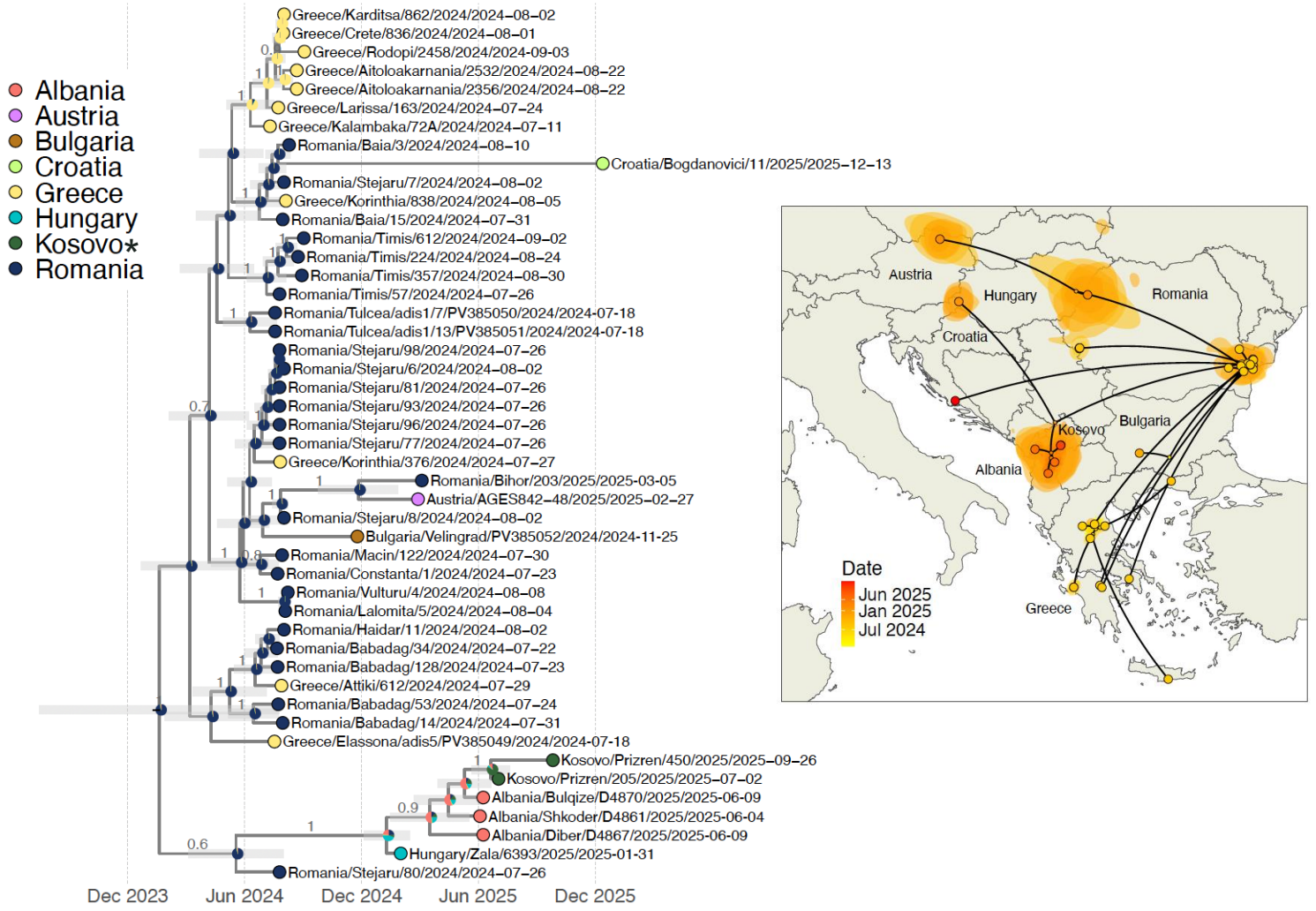
- Virus sequence analyses

Strong support for first introduction in Eastern Romania

Transmission events from

- Romania to Greece
- Romania to Hungary

Linked to official trade movement



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Insights from field and genetic investigations - PPR

Peste des petits ruminants

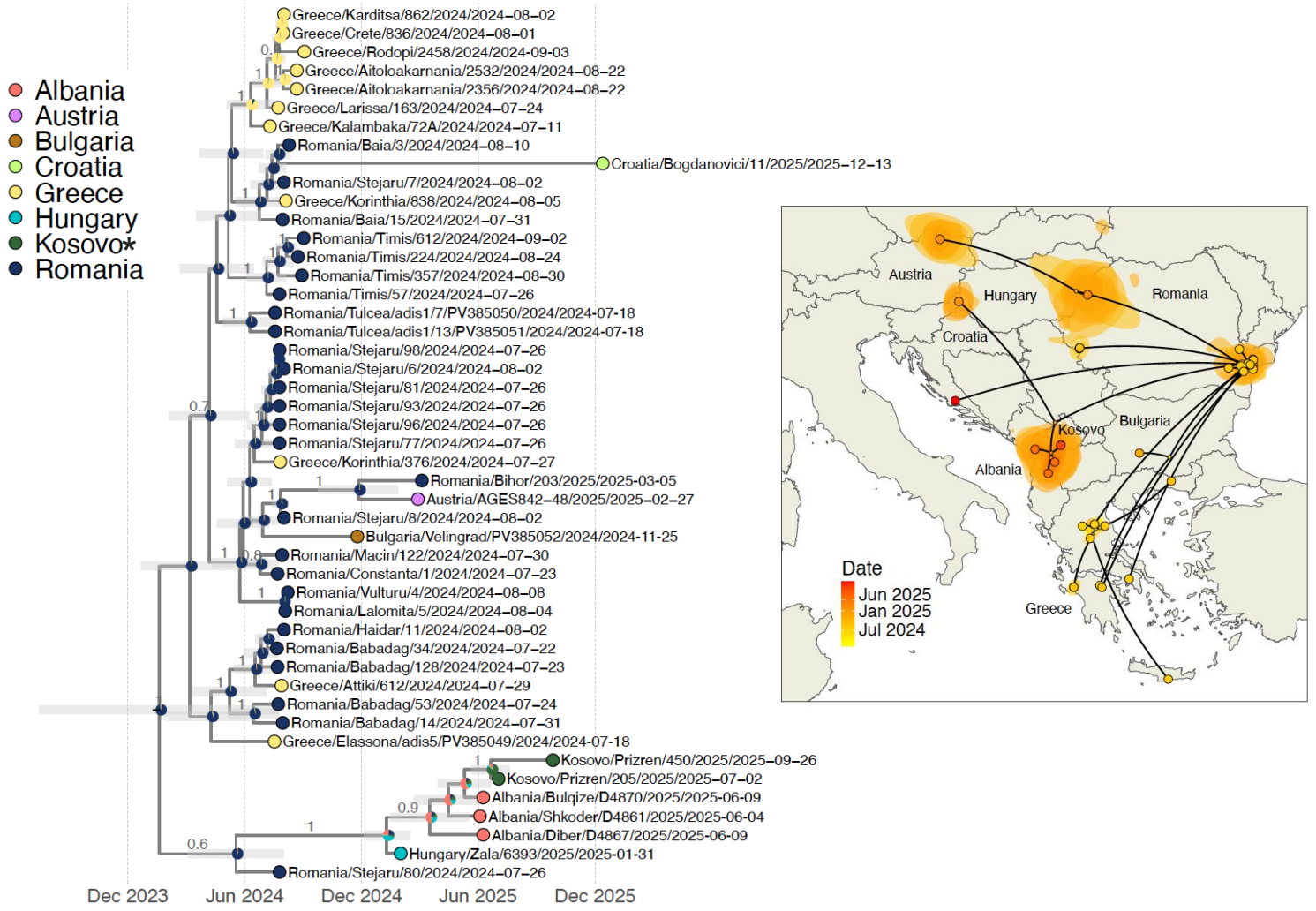
- Virus sequence analyses

Strong support for first introduction in Eastern Romania

Link between

- Albania and Kosovo*

Pointing towards illegal movement



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Insights from field and genetic investigations - PPR

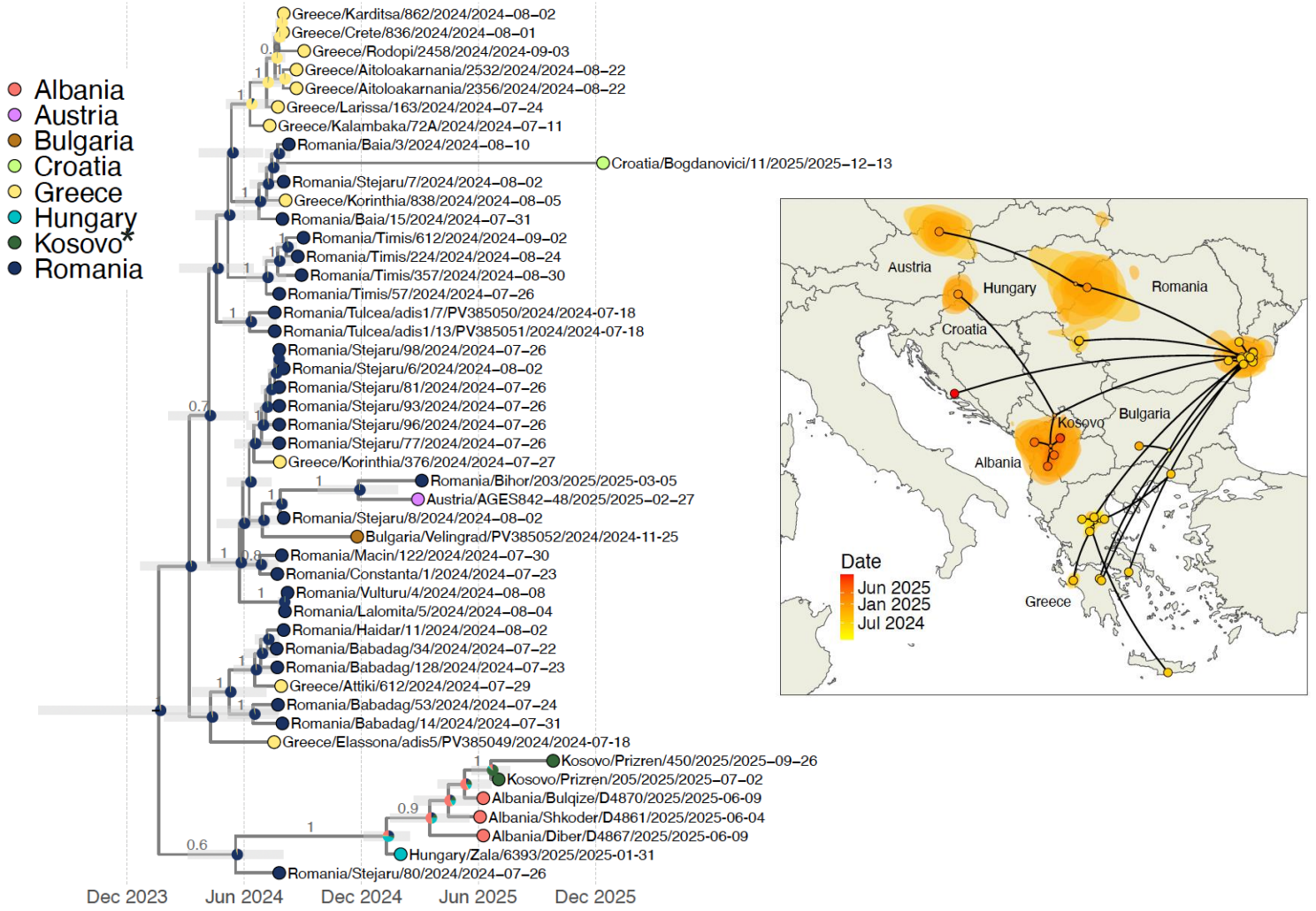
Peste des petits ruminants

- Virus sequence analyses

Big gaps in the dataset

Likely linked to undetected regional circulation

Origin of transmission in Bulgaria, Albania, Croatia unresolved



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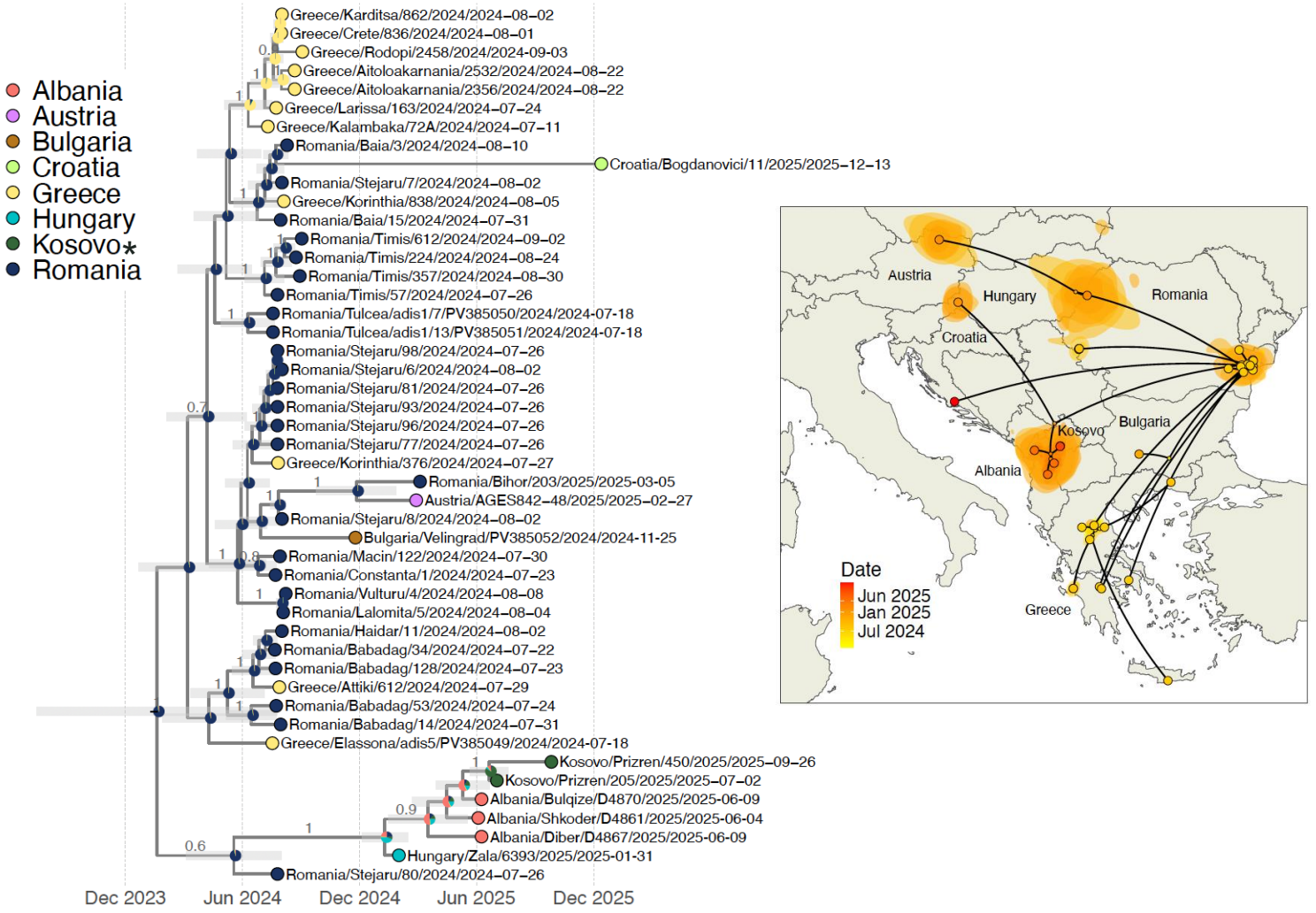
Insights from field and genetic investigations - PPR

Peste des petits ruminants

- Virus sequence analyses

Secondary outbreak in Hungary traced to movement of hay

Indirect transmission through vehicle, food, or staff



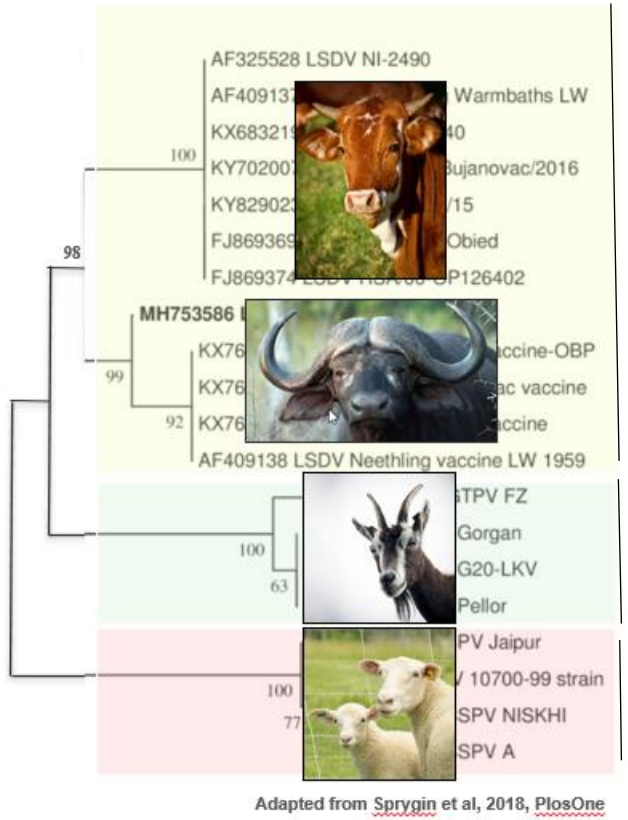
** References to Kosovo shall be understood to be in the context of Security Council resolution 1244 (1999)*

Background and consideration points - SGP

Sheep pox and goat pox (SGP)

- DNA virus, genus Capripoxvirus, family Poxviridae
- Sheep, sporadic cross-species infection of goats
- Clinical signs (~differential diagnosis)
  - Fever
  - Rhinitis, conjunctivitis, pneumonia
  - Lesions (external, internal), scabs
- Transmission
  - Direct transmission (aerosols, secretions, lesions)
  - Indirect transmission (fomites, vets, shearers, environment)
  - Disease spread related to animal movement
- High morbidity (75-100%)
- Mortality (strain and breed dependent)

Genus capripoxvirus



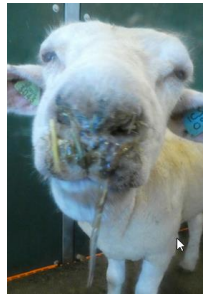
Adapted from Sprygin et al, 2018, PlosOne

- High nucleotide identity between SPPV, GTPV, LSDV: +/- 96%

Background and consideration points - SGP

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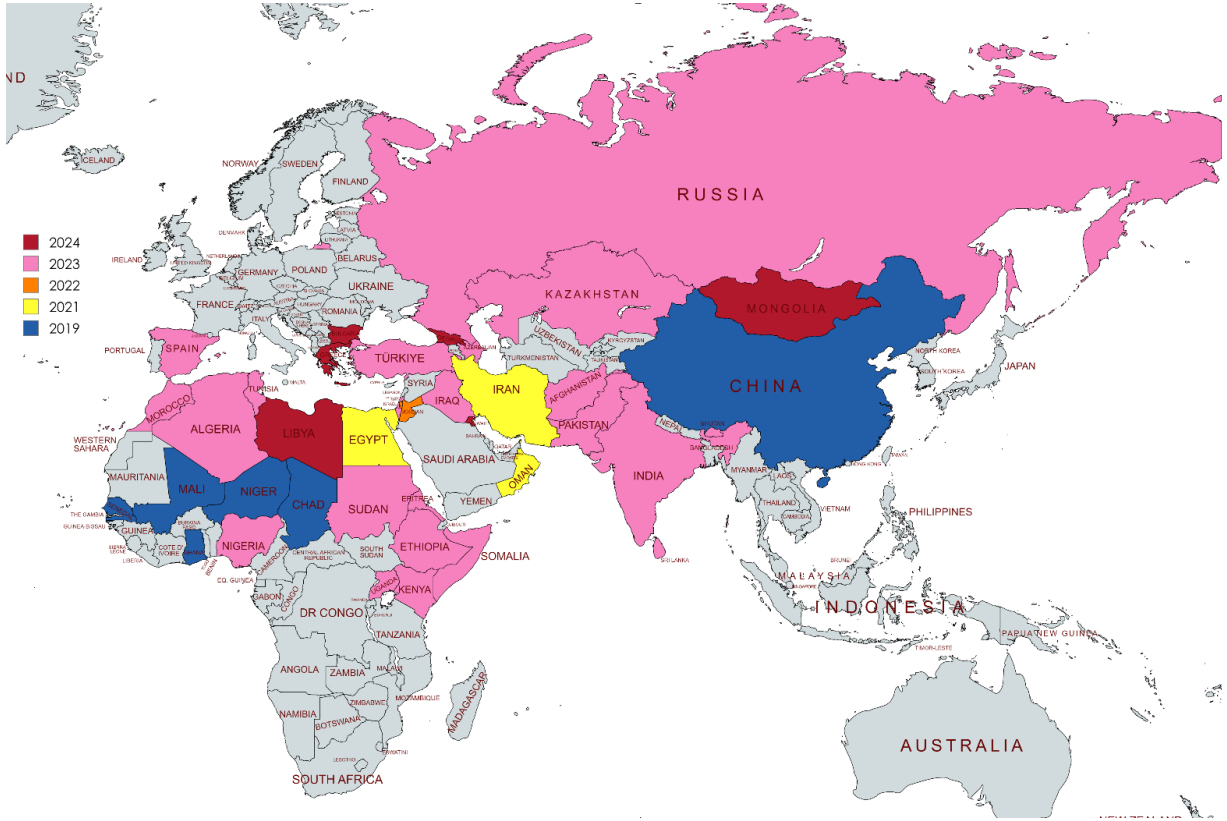


Background and consideration points - SGP

Presence around the world



Tuppurainen et al, 2017



Data extracted from WOAH-WAHIS database

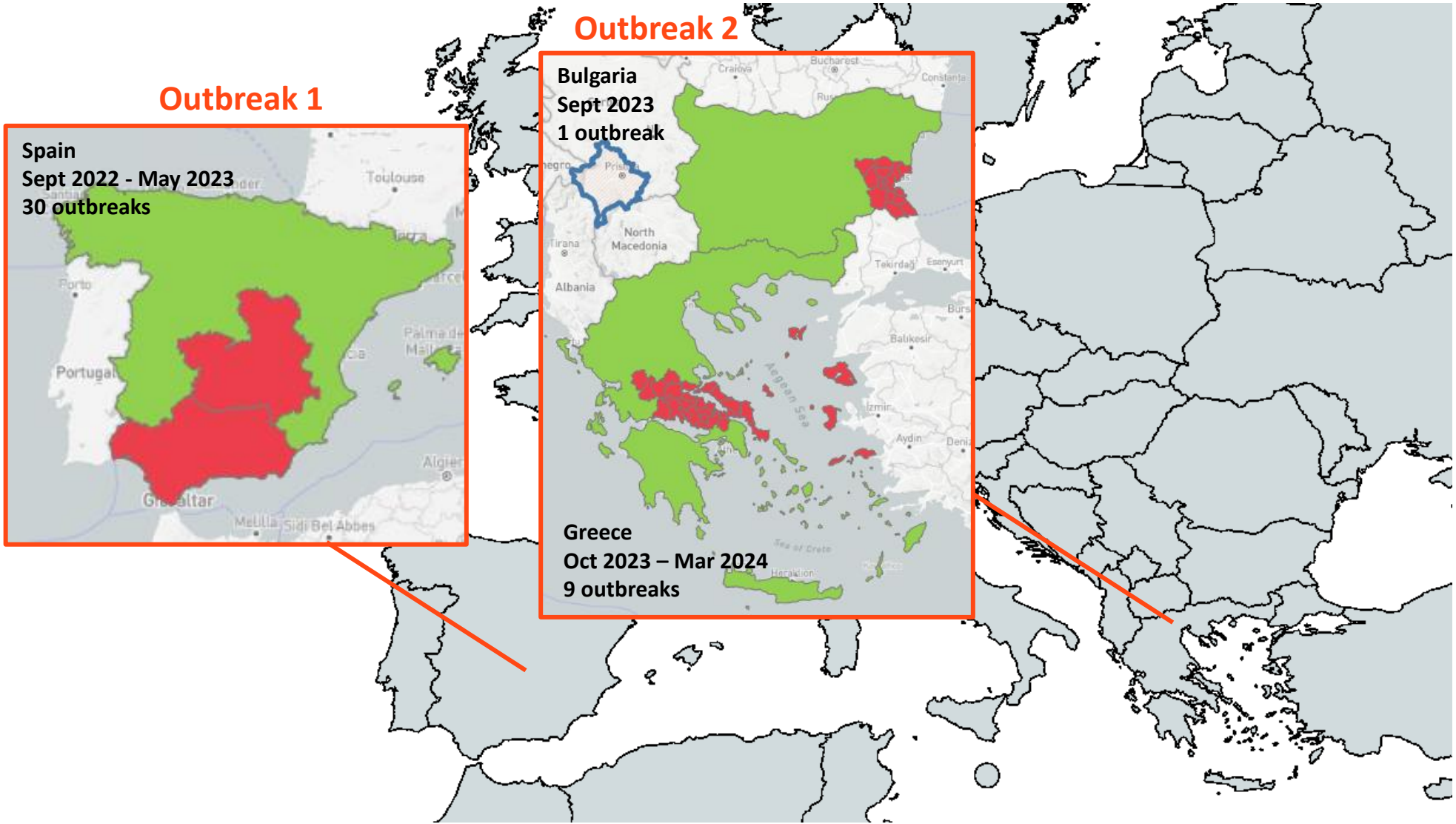
Chronology of events - SGP

Presence in Europe since 2022



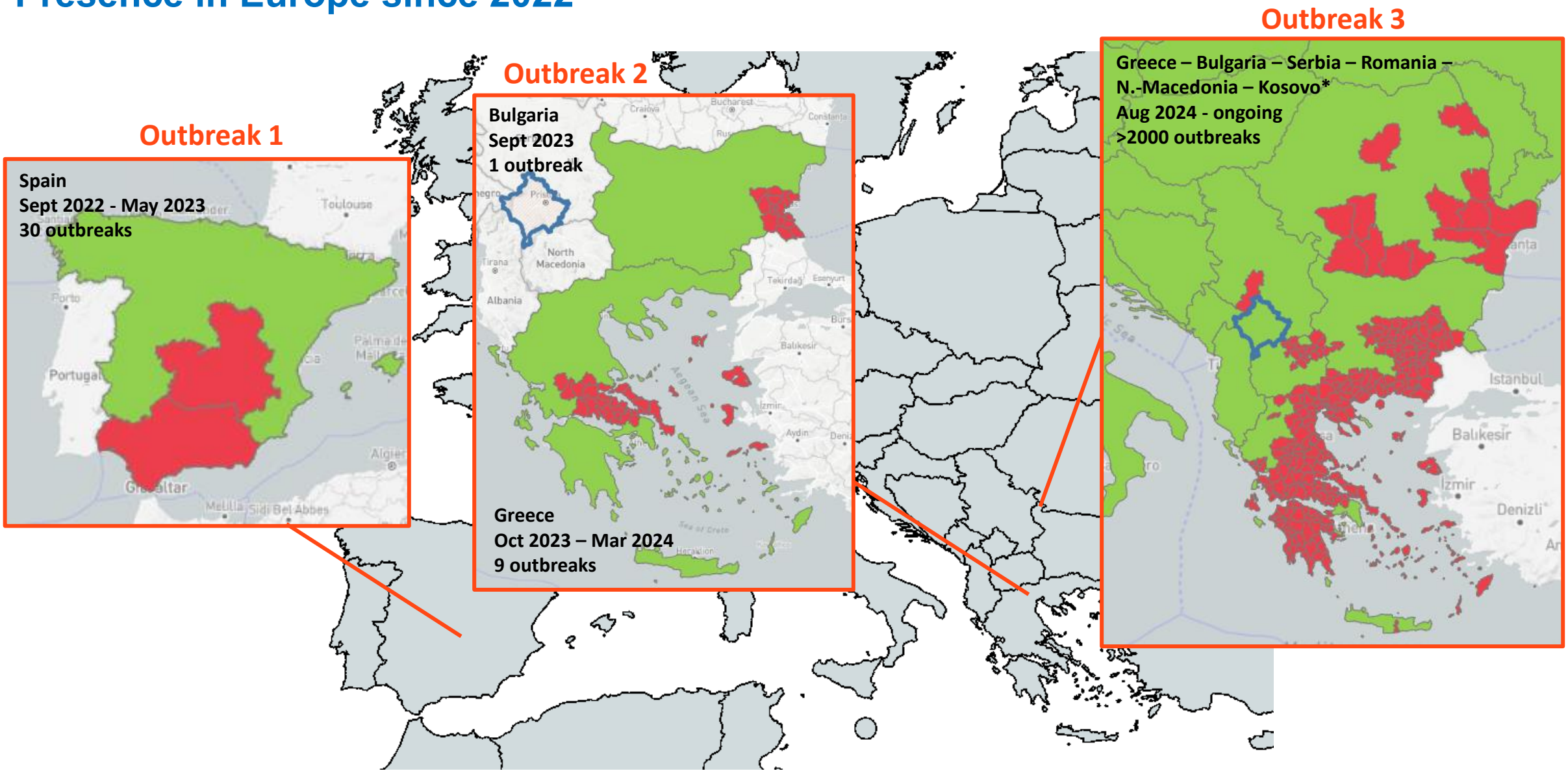
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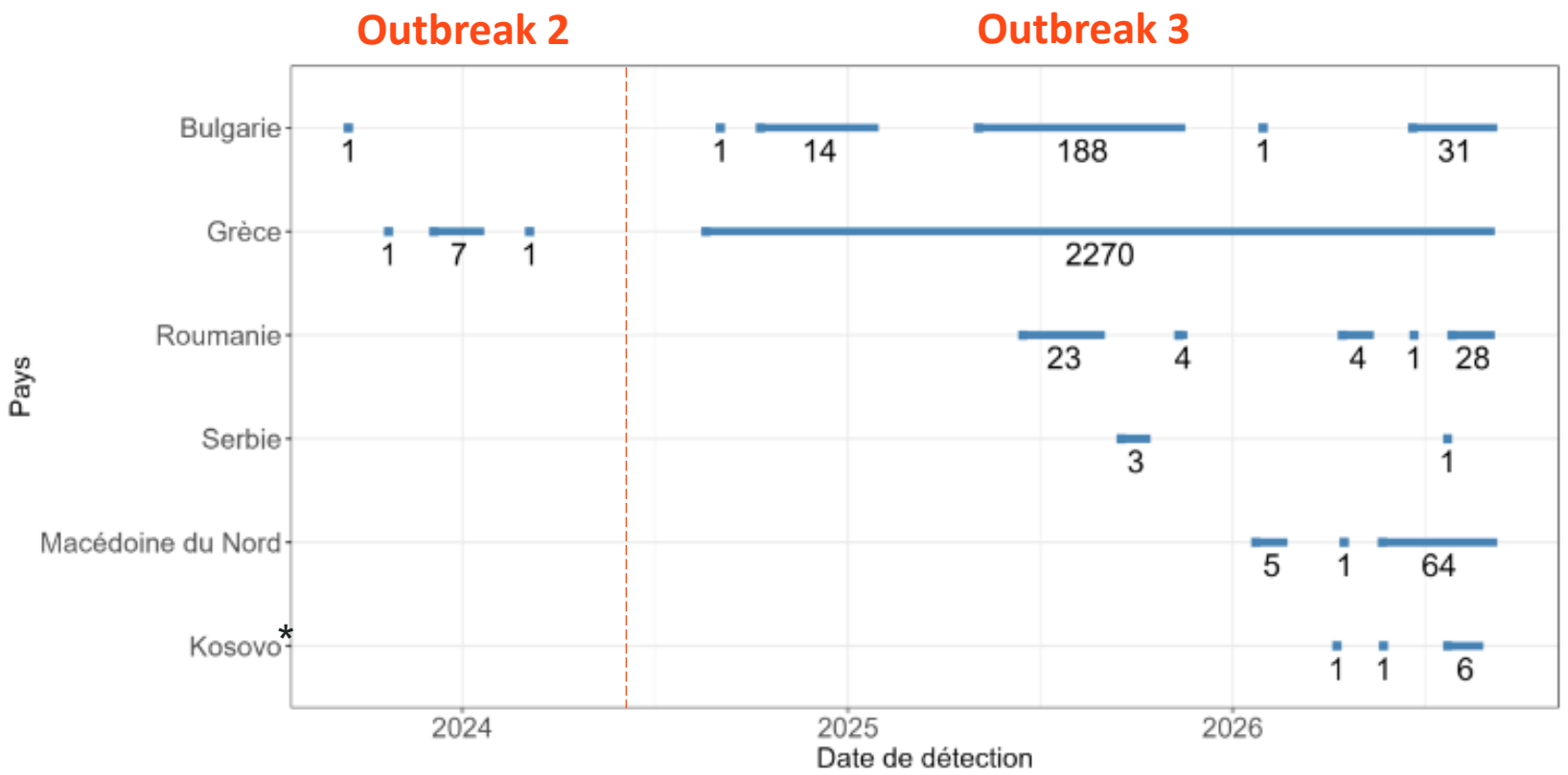


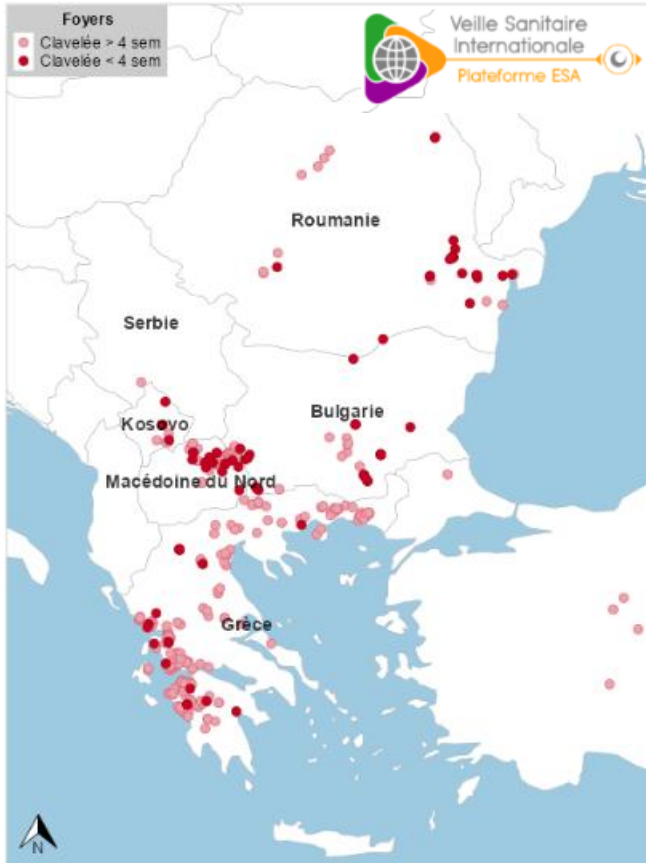
Chronology of events - SGP

Presence in Europe since 2022



Chronology of events - SGP





SPPV outbreaks Jan-Sept 2026

** References to Kosovo shall be understood to be in the context of Security Council resolution 1244 (1999)*

Insights from field and genetic investigations - SGP

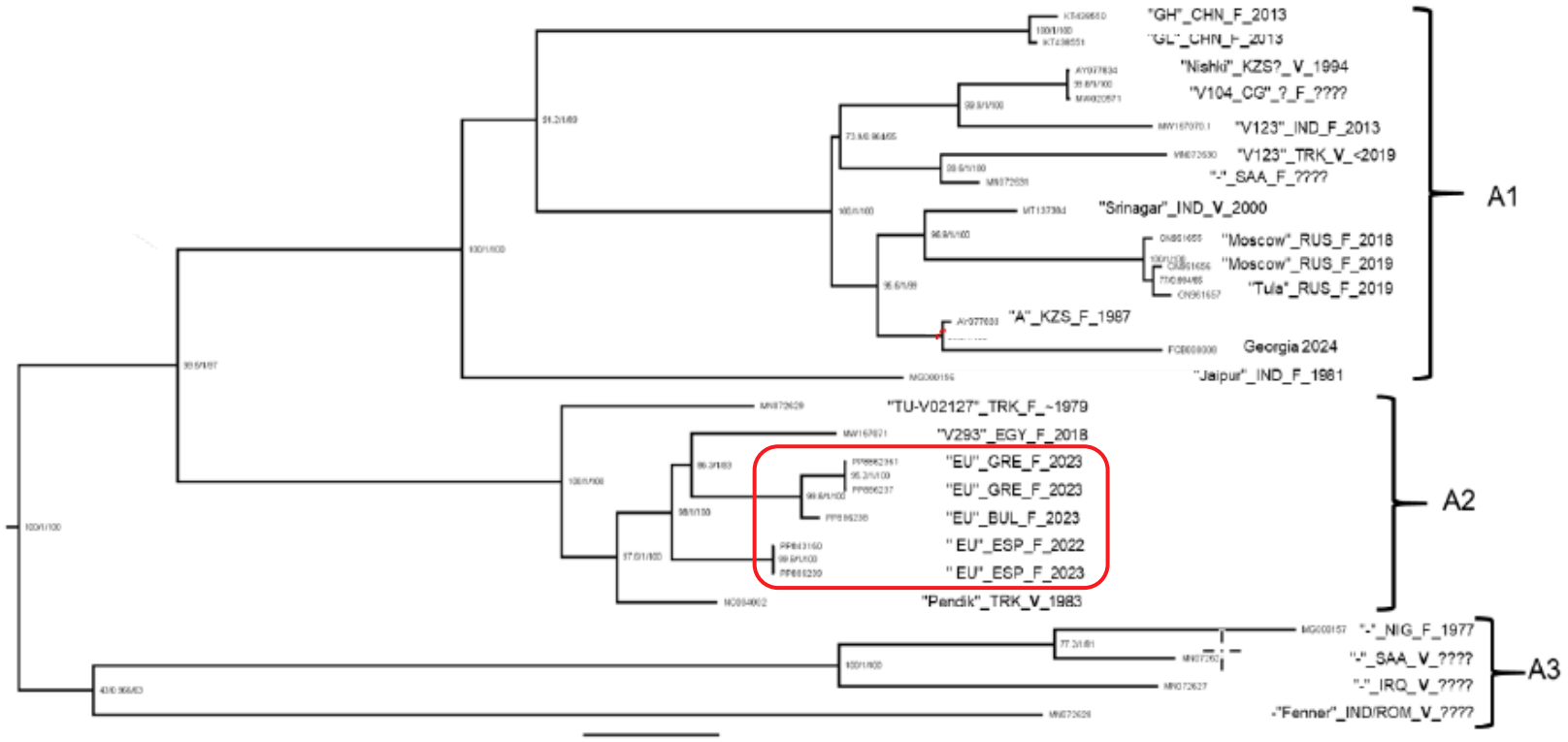
- *Poxviridae*, genus *capripoxvirus*, dsDNA, ~150-151kb in size.
- Genetically stable → no molecular outbreak tracing
- Limited WGS available in public databases



NRL Spain: Agüero M, Villalba R
NRL Greece: Tasioudi K, Chaintoutis S, Kirtzalidou A
NRL Bulgaria: Ivanova E
NRL Romania: Ancuceanu BC
NRL Serbia: Vidanović D
NRL Republic of N.-Macedonia: Djadjovski I

Insights from field and genetic investigations - SGP

outbreak 1 + outbreak 2



- Low sequence differences recent European outbreak strains (29 variable positions in total)
- Spain: only 2 indel differences between strains from the first and last outbreaks
- Greece: no genetic differences between outbreak strains from Lesvos and mainland Greece in 2023
- Denser coverage of strains necessary to potentially pinpoint the origin of introduction and identify introduction routes

Insights from field and genetic investigations - SGP

outbreak 1 | outbreak 2 | outbreak 3

- The strain of the outbreak in the Balkan that started in August 2024 belongs to clade A1 and is thus different than the strain from outbreak 1 (Spain) and 2 (Greece, Bulgaria)
- All SPPV strains sequenced from outbreak 3 in Greece, Bulgaria, Romania, Serbia and N.-Macedonia cluster together
- A phylogeny including all SPPV WGS from the recent outbreaks is part of a manuscript which is being prepared by the EURL in collaboration with the NRLs of affected countries

Control measures applied

- **In alignment with EU regulation 2020/687**
  - Stamping out, C&D, movement restrictions, epidemiological investigation, biosecurity, awareness, etc.
  - Number of outbreaks reduced after implementation
  - Beyond regulations: wider restriction zones and for prolonged time

- **Strengthened cooperation with police and custom authorities**



Control measures applied

- **In accordance or in agreement with EU regulation 2020/687**
  - Stamping out, C&D, movement restrictions, epidemiological investigation, biosecurity, awareness, etc.
  - Number of outbreaks reduced after implementation
  - Beyond regulations: wider restriction zones and for prolonged time
- **Strengthened cooperation with police and custom authorities**
- **Vaccination**
  - Animal Health Law: vaccination possible in some conditions
  - EU vaccine bank has PPR and SPPV vaccines
  - No vaccination within EU
  - Georgia: vaccination against PPR and prophylactic vaccination against SPGP
  - Türkiye vaccinating against PPR and SPG as part of control measures

Challenges reported during surveillance and control efforts

Early detection and preparedness

- Delays in detection and reporting of suspicions in the field
  - Dead animals already present with many seropositive animals
  - Extensive spread despite swift response after reporting

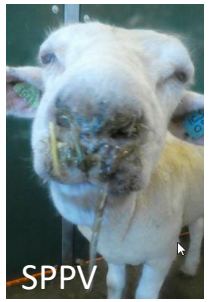
Challenges reported during surveillance and control efforts

Early detection and preparedness

- Delays in detection and reporting of suspicions in the field
  - Dead animals already present with many seropositive animals
  - Extensive spread despite swift response after reporting

Reasons:

- Lack of knowledge/awareness of field agents about disease and sampling
- NRL not always appointed or inadequate resources
- Overlapping clinical signs between pathogens; no exclusion tests
- Limited communication and/or trust between animal holder and Veterinary Services











Challenges reported during surveillance and control efforts

Early detection and preparedness

- Delays in detection and reporting of suspicions in the field
  - Dead animals already present with many seropositive animals
  - Extensive spread despite swift response after reporting

Reasons specific to PPR:

- Limited mortality or symptoms did not alarm owners or field vet
- Clear cases of subclinical transmission
- Secondary infections leading to antibiotic treatments







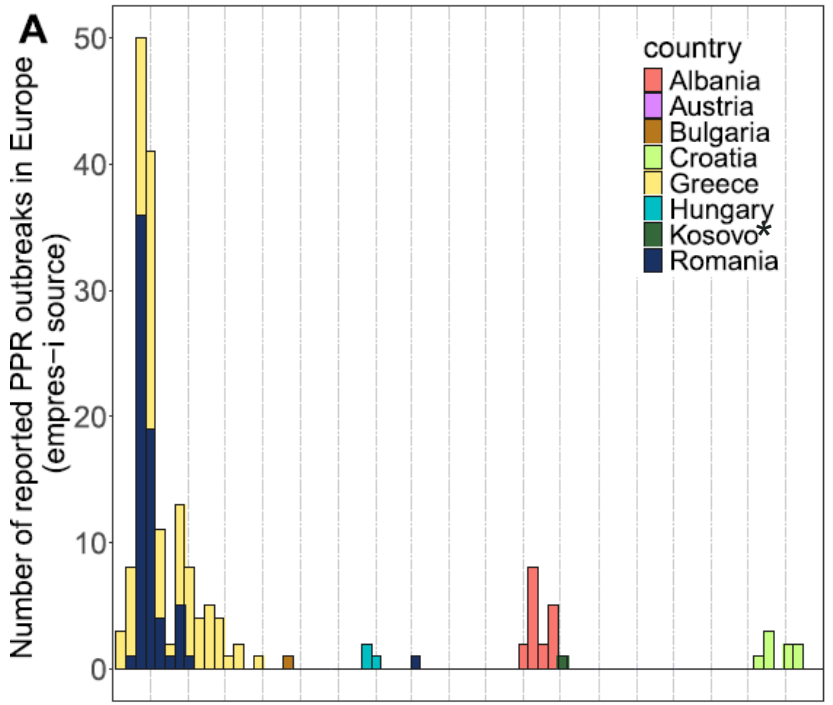


Pictures: General Direction Animal Health and Welfare, Romania

Challenges reported during surveillance and control efforts

Early detection and preparedness

- Renewed outbreaks weeks/months after control of initial cases
  - New introduction or unreported/undetected low-level spread
  - Intensive surveillance needed to detect true extent of spread
- Reporting of cases through ADIS and WAHIS
  - Apparently adequate and swift during PPR and SPGP emergence
  - Helped improve regional preparedness and surveillance effort
  - With longer circulation of the disease, increased risk of reduced reporting





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Challenges reported during surveillance and control efforts

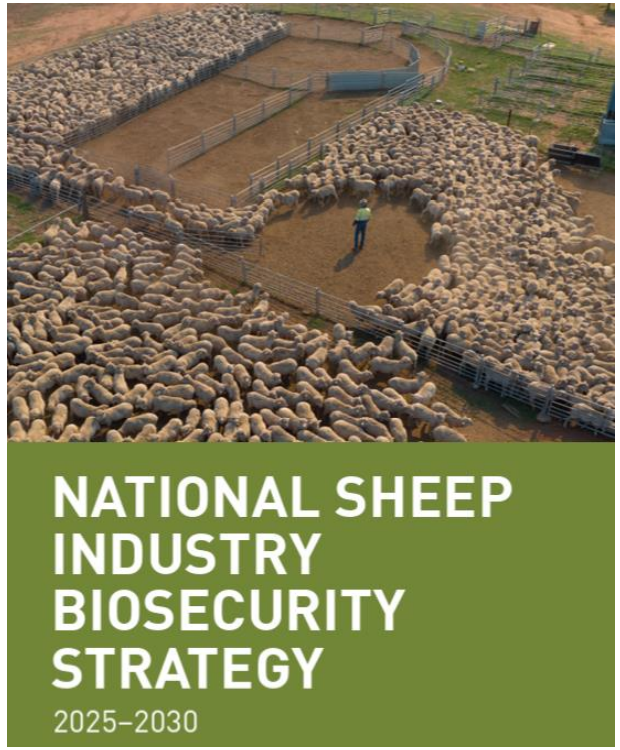
Controls efforts

- Economic and social cost of stamping out and movement restrictions
  - Poor acceptability, support of local authorities needed
  - Opposition, lawsuits against measures
  - Lack of compensation scheme in some members
  - Lack of feed, use of shared pasture, demands for meat and milk
- Contact tracing
  - Often epidemiological links not clearly identified
  - Trade links, family relationships, sharing pasture, movement of products, wool shearing teams, milk collection, etc.
- Illegal movement are main transmission routes
  - especially during religious festivities

Challenges reported during surveillance and control efforts

Controls efforts

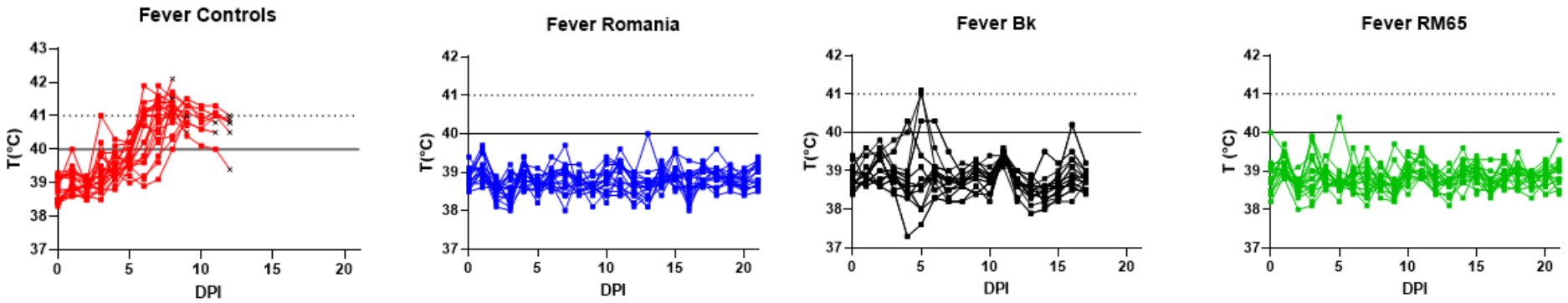
- Biosecurity
  - Poor implementation of internal and external biosecurity measures in small ruminant sector
- Common pasture
  - Hard to reach and control
  - Important risk of transmission
- Cross-border community ties
  - Higher risk of movement or illegal trade
  - Higher risk of virus transmission across border



Challenges reported during surveillance and control efforts

Controls efforts

- Reluctance to vaccinate
  - Possibility for vaccination foreseen in the legislation
  - Safe and efficacious vaccines available
  - Modeling shows that vaccination in combination with current control measures can contain the epidemic rapidly
  - Lack of EU-approved vaccine
  - Uncertainty about the impact on trade of animals and animal products
  - Uncertainty on associated economic costs

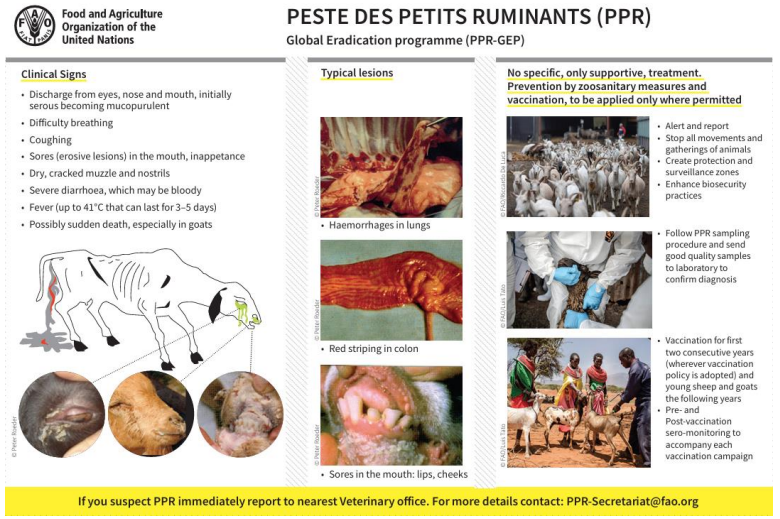


Lessons learned and priority areas for effective control

Early detection and preparedness

- Improved awareness of farmers and field veterinarians
  - Symptoms of PPR and SPGP
  - Risk of confounding factors
  - Sampling and storage procedures
  - Biosecurity measures







Lessons learned and priority areas for effective control

Early detection and preparedness

- Improved awareness of farmers and field veterinarians
  - Symptoms of PPR and SPGP
  - Risk of confounding factors
  - Sampling and storage procedures
  - Biosecurity measures



- National reference laboratories with sufficient resources
  - Guarantees trained and experienced staff
  - Avoid delays due to purchasing procedures
  - Exclusion testing schemes
  - Collaboration with international reference laboratories for sequencing and molecular epidemiology

Lessons learned and priority areas for effective control

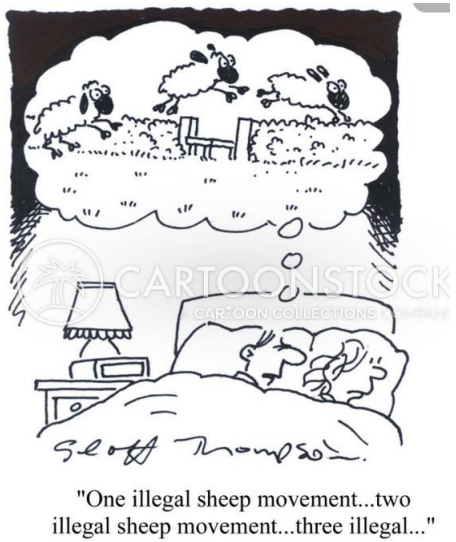
Ensure absence of undetected PPR and SPPV circulation in southeastern Europe

- Strengthened surveillance
  - Reinforcing live animal trade traceability
  - Testing animals from affected or at-risk regions even without clinical signs
  - Systematic surveillance and sampling based on risk factors (trade intensity, epidemiological links, biosecurity)
  - Implementation of large-scale surveillance programs to assess true extent of disease circulation in the region or confirm absence in a specific area
  - Confirmatory test protocol in place to deal with ‘expected’ false positive results in serology

Lessons learned and priority areas for effective control

Control measures





- Strong veterinary services
  - Adequate staff and budget to implement measures
  - Collaboration in place to ensure law enforcement
- Continued thorough application of control measures
  - Difficulty of enforcing restrictions when mortality or clinical signs are limited
  - Discussion between decision makers and veterinary services on best ways to ensure adequate response in this context
  - Fair compensation schemes should be part of contingency plans
- Increase biosecurity
  - Biosecurity level in small ruminant sector to be increased
  - Awareness of indirect transmission pathways posing risk for introduction

Control measures

- Vaccination
  - Additional control measure available when others show to be insufficient
  - Safe and efficacious live attenuated vaccines commercially available
  - EU vaccine bank for emergency response, but will not cover country-wide vaccination
  - Plans to be designed and discussed timely for rapid deployment
  - Transparent communication with neighboring countries to adapt surveillance strategy

Biological products to be included in the Union antigen, vaccine and diagnostic reagent banks as referred to in Article 3

Name of category A disease	Biological product	Type and/or strain of biological product	Number of doses	Validity period of biological product
1	2	3	4	5
Foot and mouth disease	antigen	inactivated various strains representing all seven sero-types: O, A, Asia 1, C, SAT1, SAT2, SAT3	at least 1 000 000 and up to 5 000 000 for each selected antigen, depending on the priority	at least 60 months
Classical swine fever	vaccine	live attenuated	at least 1 000 000	at least 24 months
Infection with lumpy skin disease virus	vaccine	live attenuated or inactivated	at least 250 000	at least 20 months
Infection with peste des petits ruminants virus	vaccine	live attenuated or inactivated	at least 250 000	at least 20 months
Sheep pox and goat pox	vaccine	live attenuated or inactivated	at least 250 000	at least 20 months

Lessons learned and priority areas for effective control



Cross-border collaboration

- Essential to reduce illegal animal movement
- Risks linked to pastures along national borders
- Information sharing on disease occurrence and animal movement
- Importance of regional surveillance plans
- WOAH is working on standardized methodology for veterinary authorities to regulate, monitor and restrict livestock movement

Research gaps

- PPR and SPPV are neglected animal diseases
- Research is necessary on different aspects of pathogenesis, immunology, transmission pathways (indirect transmission PPR), environmental persistence, etc.
- Genetic information of virus strains circulating in bordering regions
- Marker vaccines and DIVA tests

Conclusions

- PPR and SPPV have emerged and spread in Southeast Europe
- Legal and illegal animal movements are principal drivers of disease transmission
- Early reporting and preparedness needs to be improved
- Biosecurity in the small ruminant sector needs to be improved
- Adequate surveillance, beyond clinical examination, should be implemented and extended where necessary
- Control measures need to reinforced
- Vaccination needs to be considered
- Cross-border collaboration and information sharing is key

Thank you!

EU Reference laboratory for Peste des Petits Ruminants



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LA RECHERCHE AGRONOMIQUE
POUR LE DÉVELOPPEMENT



WOAH
Reference Laboratory
Network for PPR

WOAH Reference Laboratory
for peste des petits ruminants

Reference Centre
World Organisation
for Animal Health
Founded as OIE

For PPR (CIRAD, Montpellier, France)

https://eurl-ppr.cirad.fr/
https://www.ppr-labs-oie-network.org/

EU Reference Laboratory
for Capripox viruses



Funded by the
European Union

WOAH Reference Laboratory
for **Sheep- and goatpox**

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