Food and Agriculture Organization of the United Nations

World Organisation for Animal Health

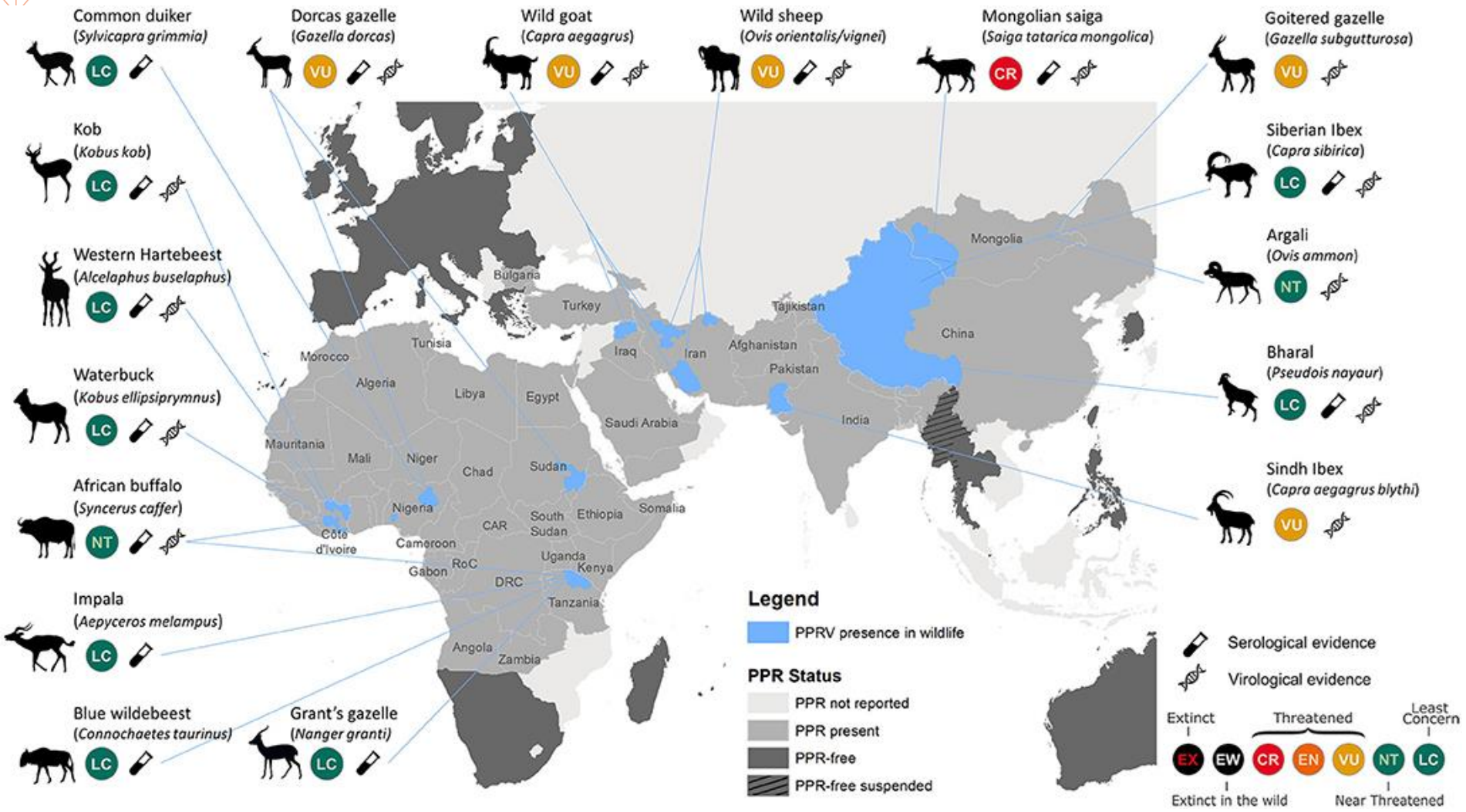
Role of Wildlife in the PPR Epi-System approach to Eradication

Amanda E. Fine

Director of One Health

Wildlife Conservation Society (WCS)

Reported Evidence of PPRV Exposure & Infection in Wildlife Species

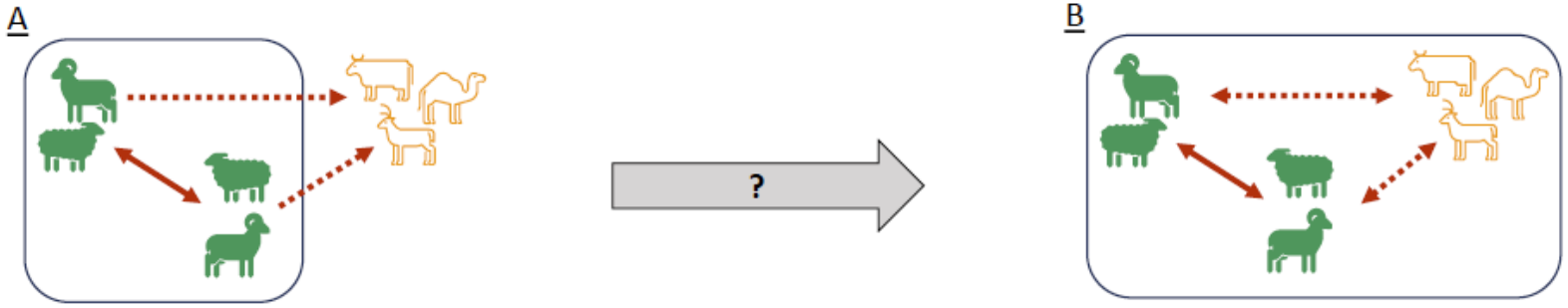


Publication:
Eradication of Peste des Petits Ruminants Virus and the Wildlife-Livestock Interface: https://www.frontiersin.org/articles/10.3389/fvets.2020.00050/full

Big Question: What is the Role of Wildlife Species in the Epi-System (in PPRV circulation)?

Food and Agriculture Organization of the United Nations

World Organisation for Animal Health
Founded as OIE



PPRV circulation only occurs between small ruminants

Can only consider target populations in elimination campaigns

Occasional backwards transmission of PPRV

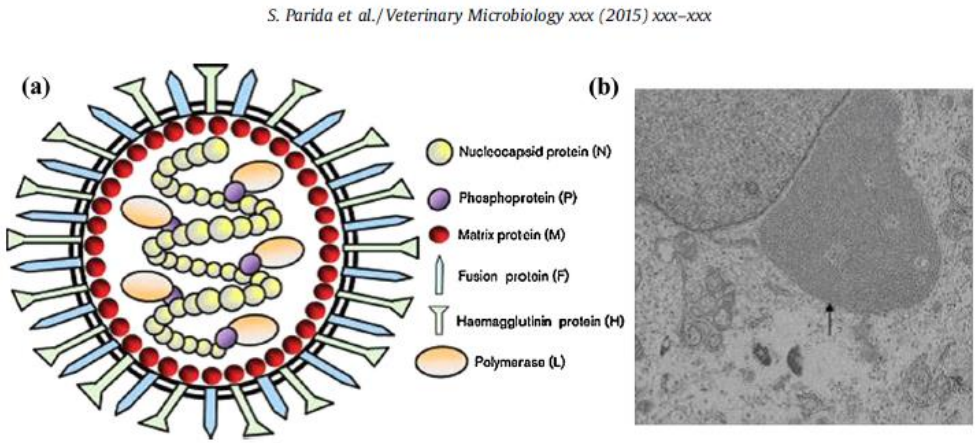
Must consider blocking or other interventions beyond target populations

Presentation by Dr. Cadhla Firth @ PPR GREN VI Meeting 2023

GF-TADs
EUROPEAN UNION
ICAR
NIVEDI

PPR in Wildlife – What does it look like?

Paramyxoviridae – *Morbillivirus caprinae*



Susceptible Species – Similar Signs & Symptoms

- Fever, nasal and ocular discharge, respiratory distress, diarrhoea, dehydration, death
- Naïve populations 90% morbidity
- Up to 100% case fatality

1.

2.

1: saiga antelope with PPR
2: domestic goat with PPR

PPR in Wildlife: What drives contact between domestic small ruminants and wildlife?

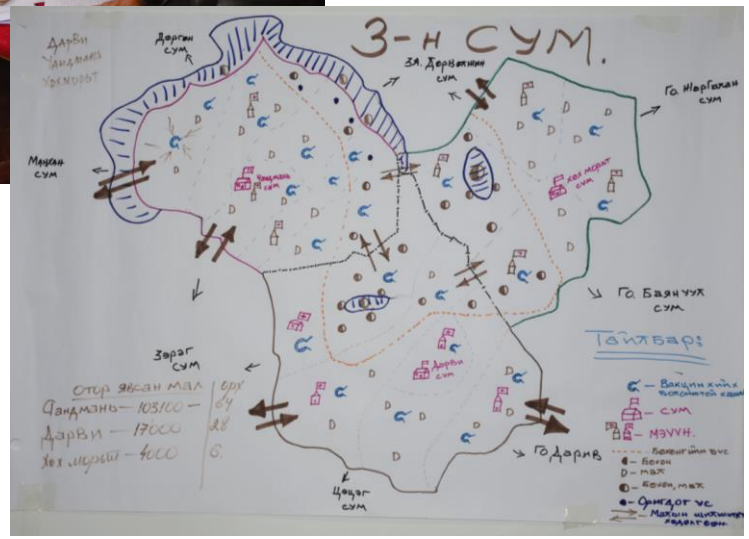
Hovd Province, Mongolia

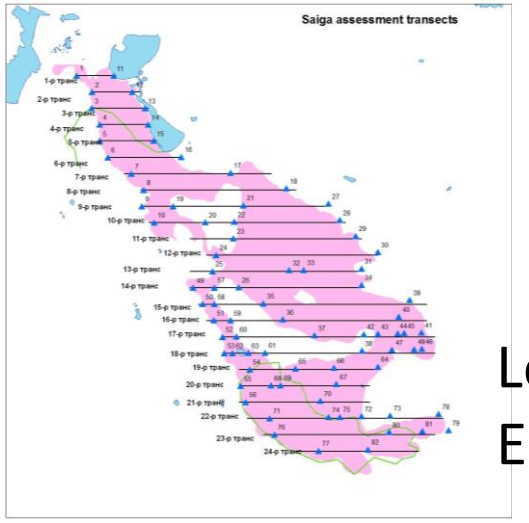
PPR in Wildlife: What drives contact between domestic small ruminants and wildlife?

Grazing Ecosystems of Mongolia, China, & Central Asia

- Livestock distribution and density
- Wildlife species range (habitat)
- Seasonal movements of wildlife and livestock
- Congregation points: water, minerals
- Grazing overlap: resource availability
- Wildlife population structure and dynamics – breeding, calving, etc.
- Interspecies-intraspecies interactions

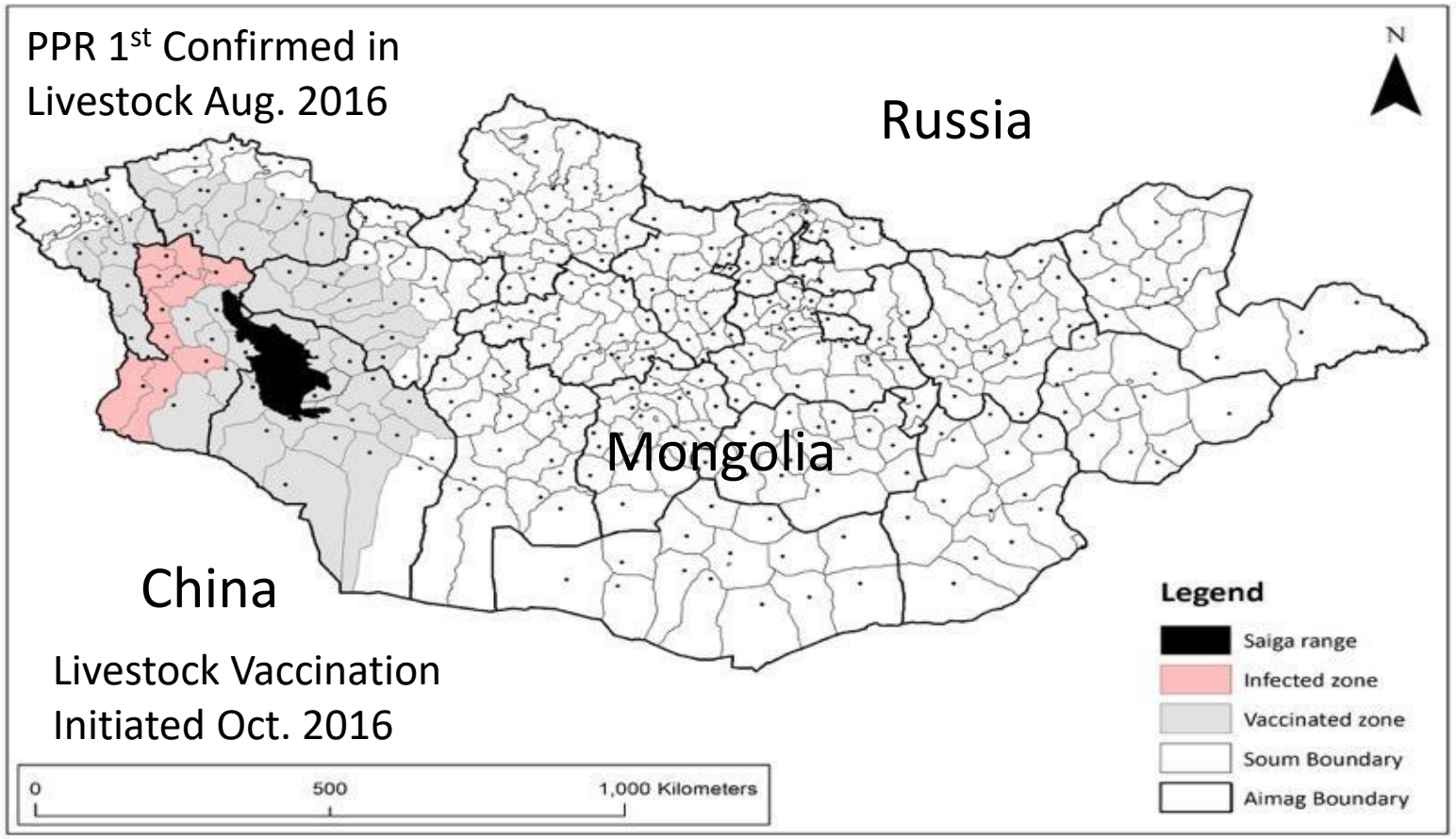
Participatory Epidemiology Methods

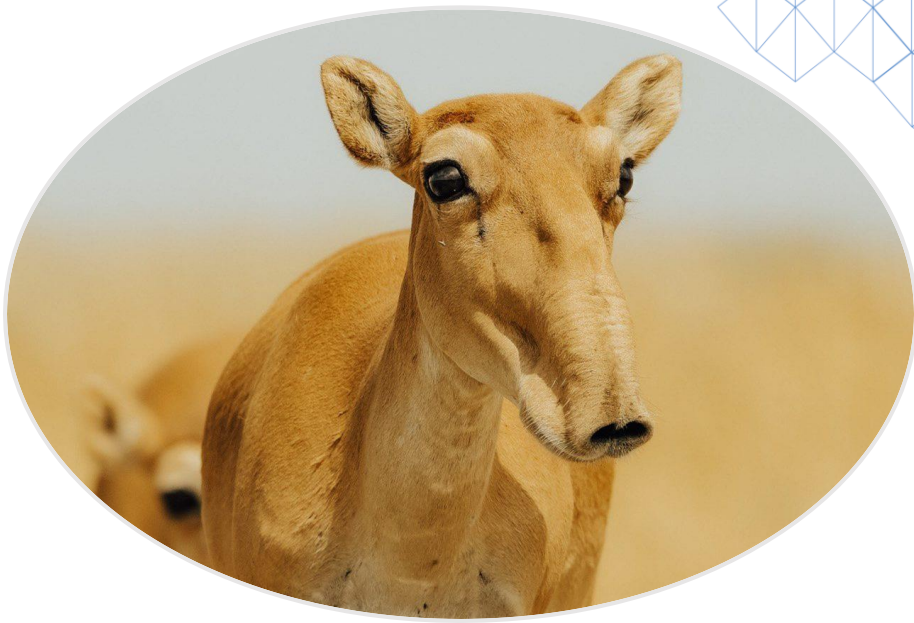




Long-term Ecological Studies

Case 1: PPR Outbreak in Saiga Antelope (*Saiga tatarica mongolica*) in Mongolia 2016/2017

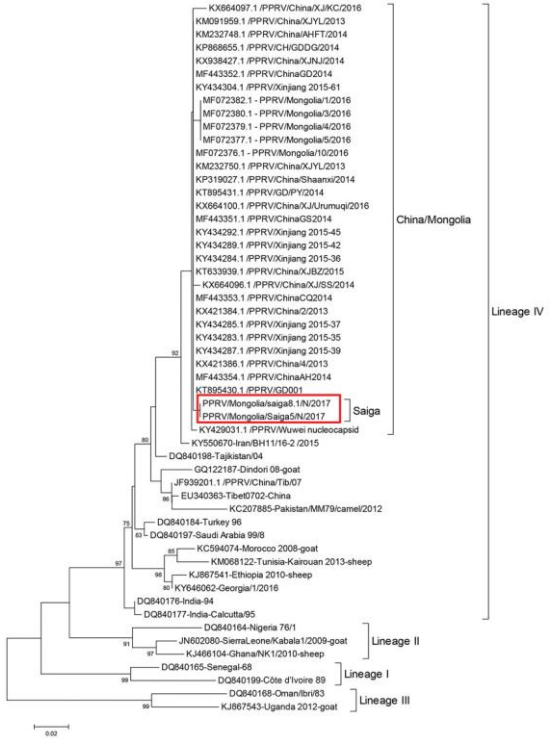




Saiga antelope are found in Russia, Kazakhstan, Turkmenistan, Uzbekistan, and Mongolia

Documentation of the PPR Outbreak in Mongolian Wildlife 2016/2017

December 2016, PPR deaths among Mongolian saiga antelope confirmed. In the following months 1,000s of critical endangered Mongolian saiga died.



Lineage IV virus clusters with sequences from livestock in Mongolia and outbreaks in China 2013-2016

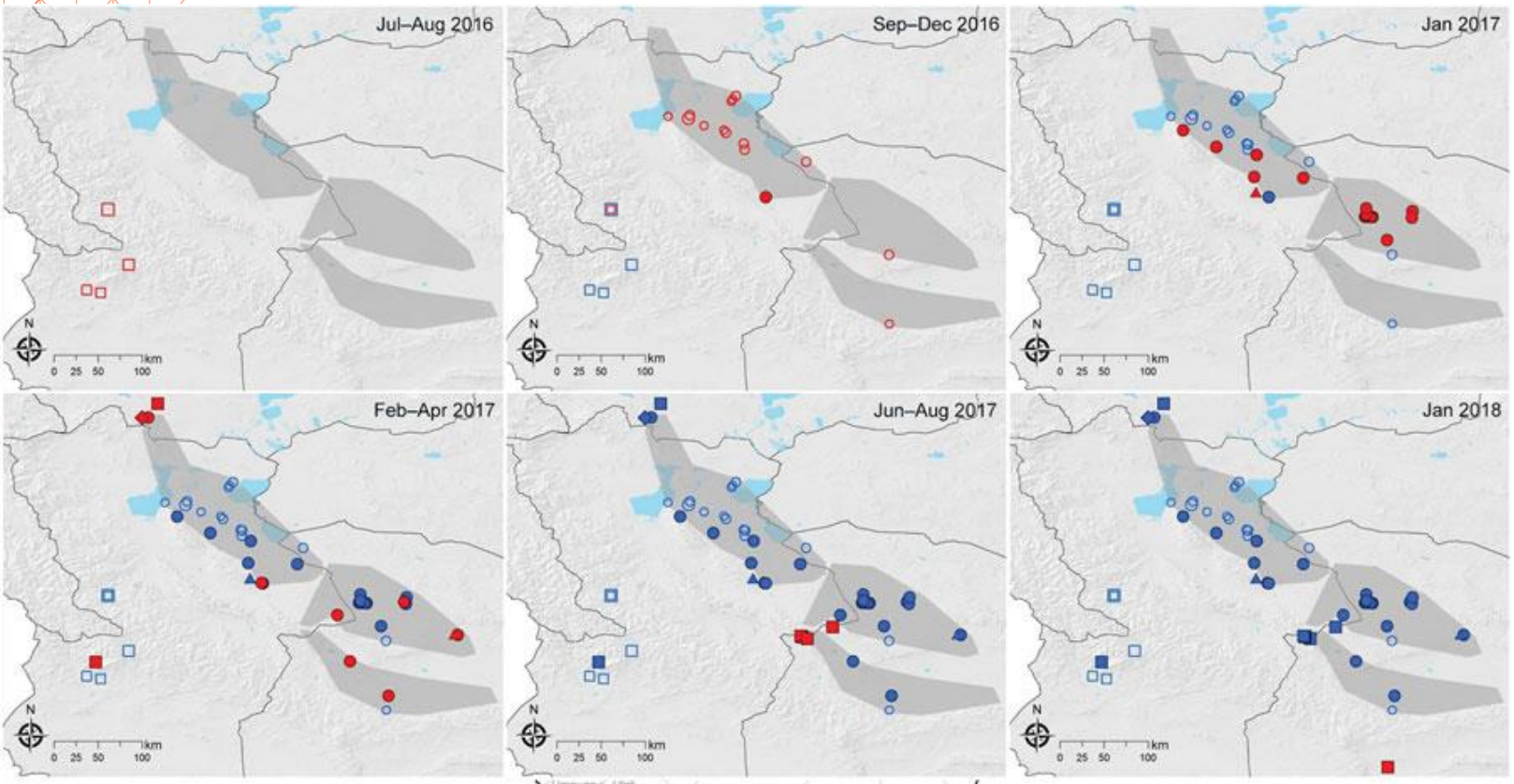
Additional Wild Ungulate Cases Confirmed

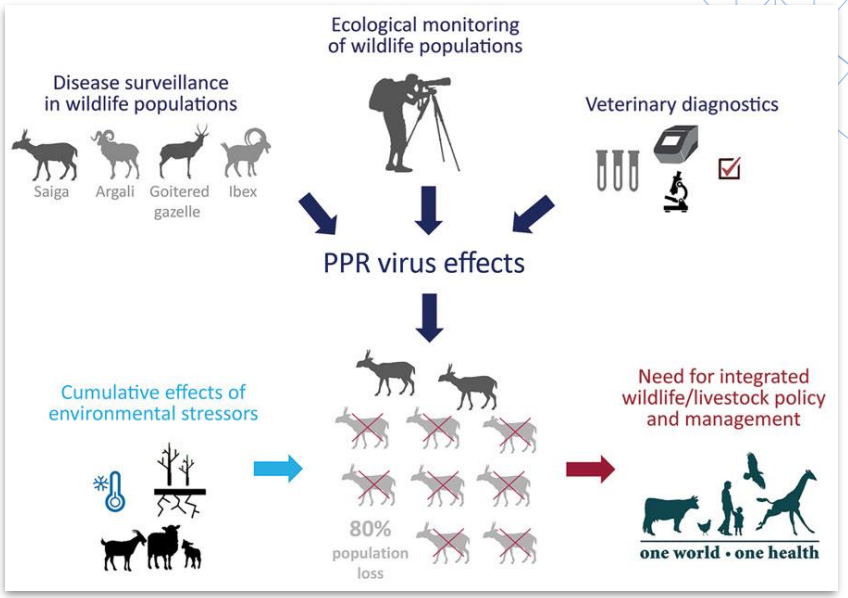
Goitered Gazelle
(*Gazella subgutturosa*)

Siberian Ibex
(*Capra sibirica*)

Argali Sheep
(Ovis ammon)

Spatial-Temporal Mapping of PPRV Outbreak in Wild Ungulates in Mongolia and Data Synthesis





- **Figures:** Pruvot M, Fine AE, Hollinger C, Strindberg S, Damdinjav B, Buuveibaatar B, et al. Outbreak of Peste des Petits Ruminants among Critically Endangered Mongolian Saiga and Other Wild Ungulates, Mongolia, 2016–2017. Emerg Infect Dis. 2020;26(1):51-62. https://doi.org/10.3201/eid2601.181998

Case 2: PPR Outbreak in Sindh Ibex (*Capra aegagrus blythi*) in Pakistan in 2023

- Sindh Wildlife Protection Agency indicates 35 Sindh ibex died due to PPR with reports from individuals working at the site indicating 250 or more Sindh Ibex died during the outbreak.

Kirthar National Park in Sindh Province

PAKISTAN TODAY E-PAPER NATIONAL OPINION CITIES WORLD SPORTS

NATIONAL September 17, 2023

35 ibex die of animal disease at Kirthar National Park

By **Staff Report**

Trop Anim Health Prod (2011) 43:745–747
DOI 10.1007/s11250-010-9776-y

BRIEF COMMUNICATION

Evidence of peste des petits ruminants virus (PPRV) infection in Sindh Ibex (*Capra aegagrus blythi*) in Pakistan as confirmed by detection of antigen and antibody

Muhammad Abubakar · Zahid Iqbal Rajput · Muhammad Javed Arshed · Ghulam Sarwar · Qurban Ali

Accepted: 27 December 2010 / Published online: 9 January 2011

Case 3: PPR Infection in Bharal (*Pseudois nayaur*) and Argali Sheep (*Ovis ammon*) in China in February 2024

veterinary sciences

MDPI

Brief Report

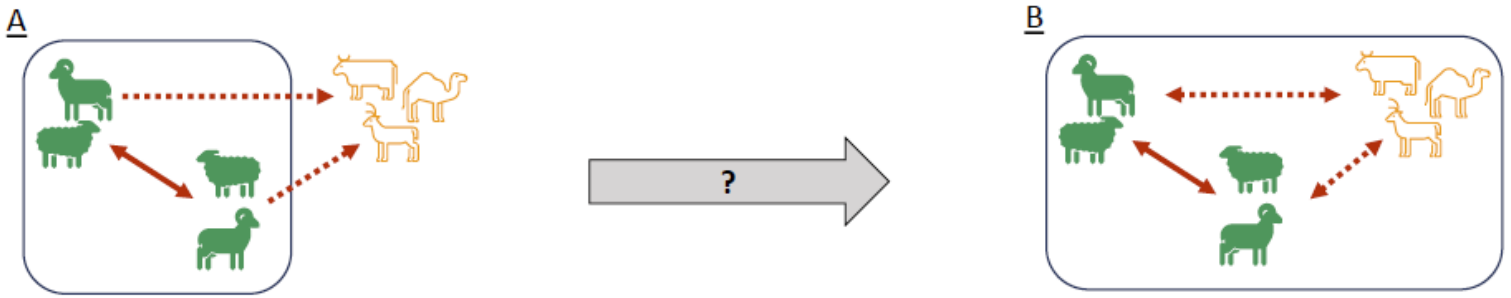
Wildlife Infection of Peste des Petits Ruminants Detected in China, 2024

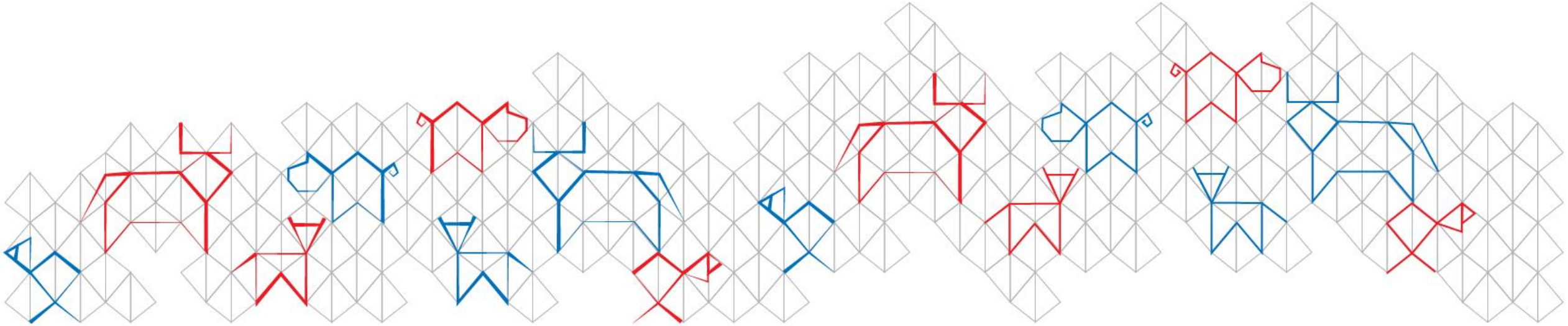
Jiao Xu [1], Zebin Qu [2], Yingli Wang [1], Weijie Ren [1], Shan Liu [1], Yanli Zou [1], Na Su [2], Jingyue Bao [1] and Zhiliang Wang [1,2,*]

- Sixty-five Bharals and Argali with clinical signs consistent with PPR reported in Feb 2024
- Southern Rutog County, Tibet Autonomous Region
- Sequenced PPRV (ChinaTibet2024): Lineage IV and closely related to PPRVs isolated in China 2013 – 2014
- Study confirms virus exists in wild ruminants – source unknown.
- Presumably spillover from domestic livestock?

Wildlife Role in the Epi-System – Information is Critical

- PPR Outbreaks in Wildlife – key source of information
  - Field Epidemiology + Molecular Epidemiology
    - Surveillance event data (geo-referenced)
    - Individual animal data (include common and Latin name)
    - Specimen data
- Sites at risk for PPR transmission at the wildlife/livestock interface
  - Consequences for wildlife, consequences for PPR eradication





Thank You