



World Organisation
for Animal Health
Founded as OIE



Sponsored by People's
Republic of China

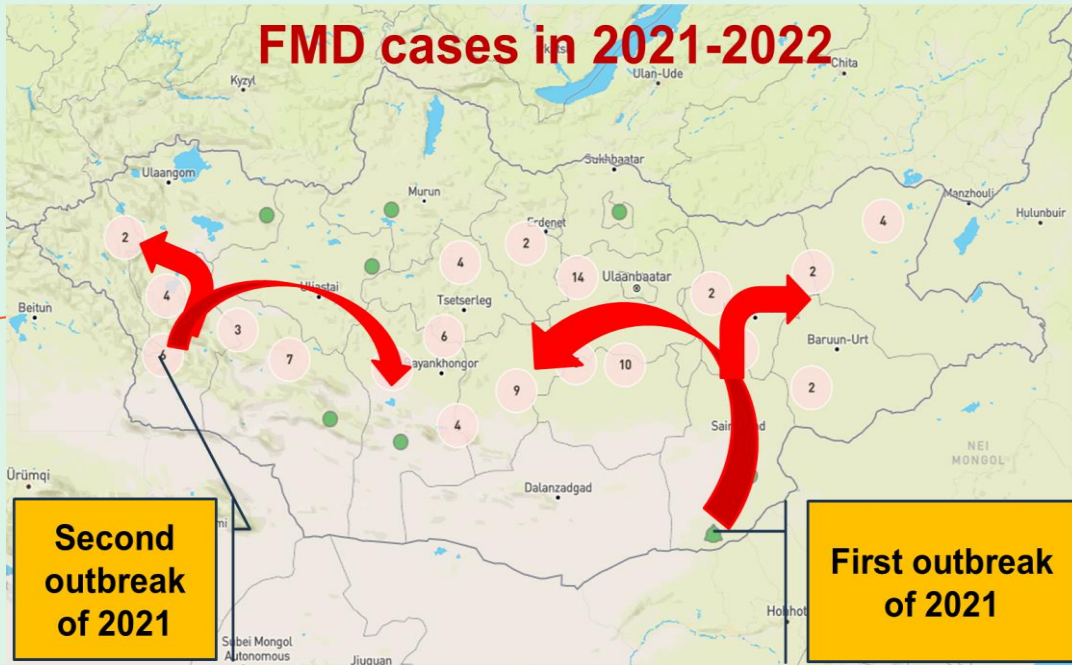


SEACFMD Laboratory Network Meeting

Current FMD Laboratory Activities in Mongolia

Bodisaikhan.Kh
Officer in GAVS

24-25 October 2023
Lanzhou, China



Last FMD outbreak was reported in October, 2022 in Mongolia.

Between 2020-2022 FMD virus spread across the country and FMD outbreak reported in 100 soums (village) in 19 provinces of the country.

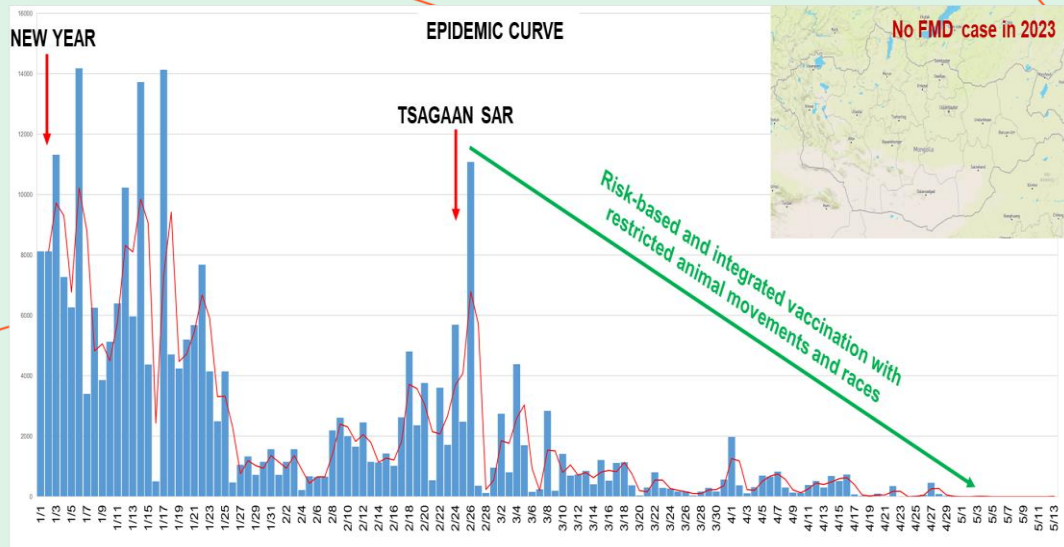
GAVS introduced the nationwide vaccination of large ruminants (only cattle and yaks) from March 2022.

Since this activity GAVS applied 4 times vaccination apart 6 months. Last vaccination is on going now.

Therefore, GAVS introduced passive surveillance first time in Mongolia after number of training (outbreak investigation, early detection EWAR system using MAHIS) and conducted active surveillance including post vaccine monitoring.

Above number of control activity, FMD no case reported.

FMD not reported in 2023.



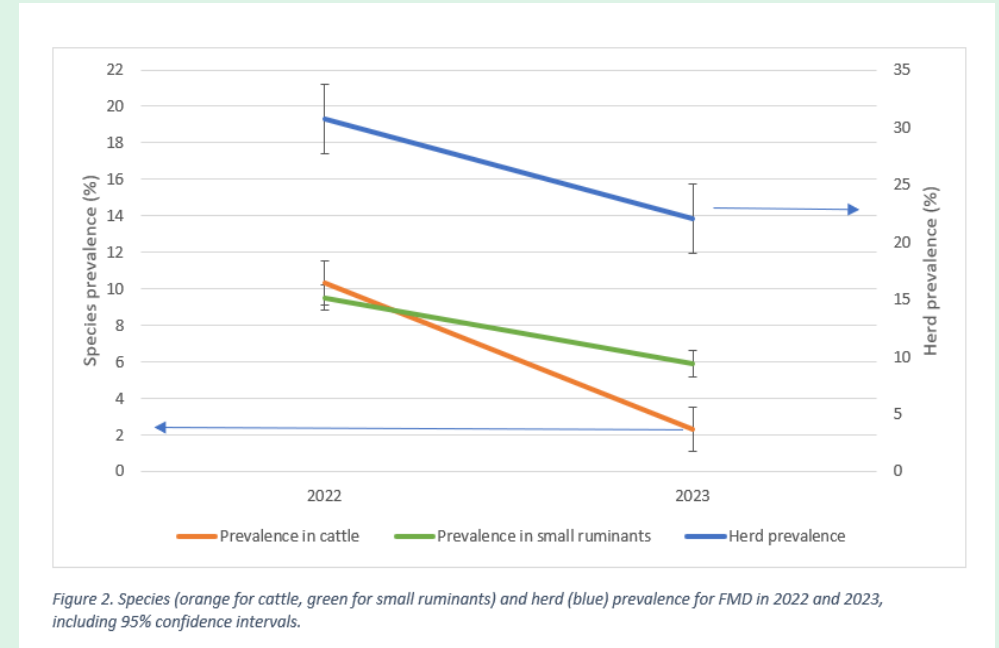
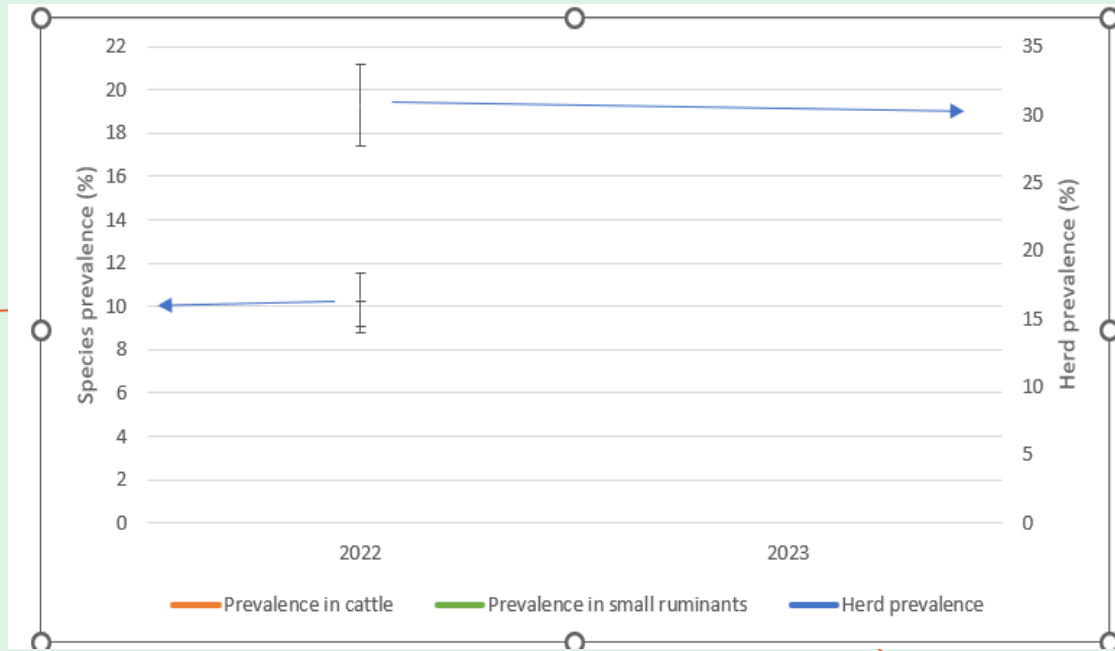


Figure 2. Species (orange for cattle, green for small ruminants) and herd (blue) prevalence for FMD in 2022 and 2023, including 95% confidence intervals.

When comparing the Spring 2023 with the Spring 2022 results, it becomes clear that

- 1) The overall animal-level prevalence in 2023 is statistically significant lower than in 2022.
- 2) The results of 2022 demonstrated that the sero-prevalence between cattle and small ruminants were similar. In 2023, not only is the overall sero-prevalence lower, see point above, also the sero-prevalence in cattle is 2,5 times less than in small ruminants;
- 3) The herd-level prevalence in 2023 is statistically significant less compared with 2022. This results in fewer FMD seropositive animals per infected herd.

It can be concluded that the applied vaccination tactic of 'cattle and yak only' have had a substantial impact on bringing down the overall 'virus load' or exposure to FMD virus in Mongolian livestock. It also demonstrates that vaccination of large ruminants has an significant impact on small ruminants that are not part of the vaccination tactic.

Year	Number of samples received at National Laboratory	Number of samples tested	No. of serotype O viruses	No. of serotype A viruses	No. of serotype Asia 1
2021	35,935	4,122	1,247	201	201
2022	39,476	5,830	2,098	336	336
2023	4,616	1,296	286	6	6
Total	80,027	11,523	3,631	543	543

Number of samples analyzed for differential diagnosis of type A and Asia-1



FMD Virus characterization (serotyping and genotyping) result:

	Number of samples send to RRL and WRLFMD	O/ Mya-98	O/ PanAsia	O/ Cathay	O/ Ind2001e	A/ SEA-97	Asia 1
2021	Pirbright (WRLFMD) ARRIAH (RRLFMD)				4 3		
2022	Pirbright (WRLFMD)				10		
2023					0		
Total					17		

Only O/ME-SA/Ind2001 serotype was registered In 2021-2023.



Qualification ISO/17025

Framework	Assured Organization	Participating date/year
	MASM	2003
	MASM	2005
	MASM	2007
	MASM	2011
	MASM	2014
3413	MASM	2017
3416	MASM	2019

In last years, Mongolia is using serotype O and A type of FMD vaccine produced in ARRIAH, Russia. In below, showing last 2 year's PVM results after huge outbreak of FMD

Purpose of the PVM:

The objective of this post-vaccination monitoring sero-survey was to assess the level of herd protection against FMD based on vaccination (applied in April 2022) in combination with natural infection. Natural infection of FMD was evident in 2021 and early 2022 based on the numerous reports of outbreaks.

To limit the impact of natural infection, GAVS introduced the nationwide vaccination of large ruminants (cattle and yaks).

Methodology:

In every Mongolian soum, three herders were selected randomly. In each herd, three cattle (born in 2021 or before) were sampled. Samples were tested using FMD-SP ELISA for serotype A and serotype O at the State Central Veterinary Laboratory (SCVL) in Ulaanbaatar.

In statistical terms, one can only conclude when all three samples test sero-negative. In that situation (see situation 4 in Table 1), one can conclude with 90% confidence that the herd protection is less than 60%. To protect against FMD virus, that is interpreted that the herd is unprotected.

Results

Information available 3,059 cattle sera, originating from 1,008 herders in 335 soums.

Herder-level results

Of the 1,008 herds, 917 (95.3% [93.8 – 96.6%]) herds were sufficiently and well protected based on the results of SP-ELISA against serotype O, see Table 1).

Table 1. Cross-tabulation of serology testing against FMD serotype A and serotype O for 962 herds in 320 Mongolian soums.

Per herd		
Based on SP-serotype O	Herds	Percentage [95%Confidence interval]
Herd unprotected	16	1.6% [0.9 – 2.6%]
Herd dubiously protected	29	2.9% [1.9 – 4.1%]
Herd sufficiently and well protected	963	95.5% [94.0 – 96.7%]
Total	1,008	



Soum-level results

Of the 335 soums, the large majority (330 soums, 98.5% [95%CI: 96.6 – 99.5%]) soums is well or sufficiently well protected against FMD Serotype O as result of circulating FMD virus and the vaccination campaign conducted in April 2022 (Table 4).

Herds well protected (value = 2)	Herds dubiously protected (value = 1)	Herds not protected (value = 0)	Sum	Soum protection level (by vaccination and/or previous infection)	
3	0	0	6	Well protected	319
2	1	0	5	Well protected	
2	0	1	4	Sufficiently protected	11
1	2	0	4	Sufficiently protected	
1	1	1	3	Dubiously protected	3
1	0	2	2	Dubiously protected	
0	2	1	2	Dubiously protected	
0	1	2	1	Unprotected	2
0	0	3	0	Unprotected	

Table 4. Soum protection level defined by combination of herd statuses for serotypes O.

Conclusion:

96% of herds were well protected against FMD virus. Less than 5% of sampled herds are categorized as unprotected or insufficiently protected.

Sixteen herds (1.6% [95%CI: 0.9 – 2.6%]) tested all samples negative for serotype O. This means that herds were unprotected against circulating FMD virus. Another 29 herds (2.9% [95%CI:1.9 – 4.1%]) were categorized as dubiously protected against circulating FMD virus.

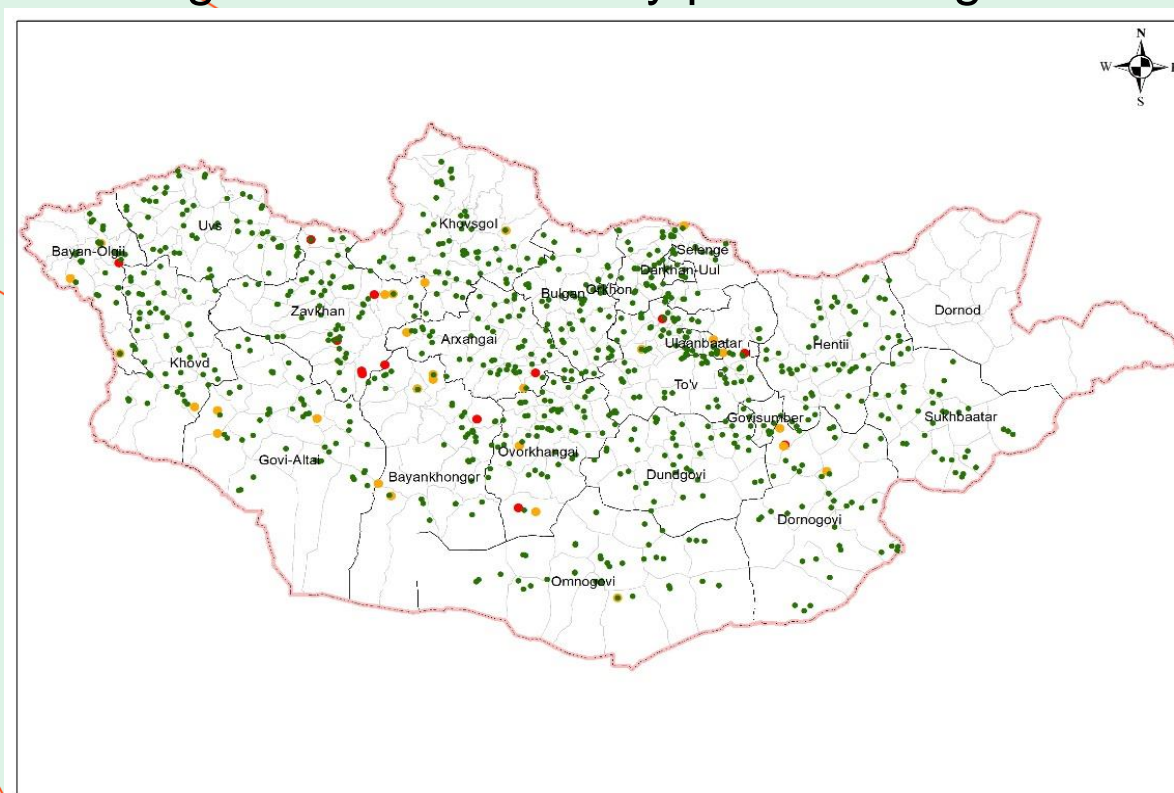


Figure 1. Location of unprotected herds (red dots), dubiously protected herds (yellow) and sufficiently and well protected herds (green cross).

Purpose and Methodology:

Same objective and methodology with 2022 was used.

(Number of sample from 1 herder added: 6 sample from 1 herder and 3 herder from 1 soum).

Results

Information available 6048 cattle sera, originating from 1,008 herders in 335 soums.

5742 (94.9.0%) samples from 1001 herding households in 22 provinces, 335 soums and showed positive results.

Epidemiological analysis of 2023 PVM is doing now, not finished yet

In Mongolia 2 kind of PVM studies conducted in 2019 and 2022.

1. Immunogenicity of imported foot-and-mouth vaccines in different species in Mongolia
2. comparison of vaccination schedules for foot-and-mouth disease among cattle and sheep in Mongolia
(<https://www.frontiersin.org/articles/10.3389/fvets.2023.990043/full>)



Challenges:

Budget, finance and vaccine availability

There is a lack of legal framework for the development of compartmentalization

It is difficult to control the movement of animals due to the characteristics of pastoralism

Way forward:

Continue implementation of vaccination measures until 2025

Support trade in livestock products through the development of compartmentalization

Information and publicity about the dangers of the disease to herders and people with animals

Update the national FMD control strategy and confirm the FMD control program by WOAHA



Thank You