



SOCIO-ECONOMIC STUDIES ON THE IMPACT OF FMD IN SOUTH-EAST ASIA

EXPANDED 3RD COORDINATION COMMITTEE MEETING OF OIE/JTF PROJECT ON FMD CONTROL IN ASIA
LANZHOU, P.R CHINA
SEPTEMBER 24, 2014

Dr Karan Kukreja

Project Officer
OIE Sub-Regional Representation for South-East Asia
Bangkok, Thailand
Acknowledgements: R Abilla



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Protecting animals, preserving our future

Outline

- Review of socio-economic studies conducted in the sub-region
- Macro-economic Study in GMS
- Design and conduct of micro-economic studies in Cambodia, Lao PDR and Myanmar



REVIEW OF LITERATURE



Increased Mortality

Rast et al 2010, Laos	•Adult animals valued at USD 230 each. •Calves valued at USD 58 each	Young et al 2013 Cambodia	•The cost of selling a dead cow was calculated by subtracting the salvage value from the average healthy cow value, multiplied by the mortality rate	Beyi 2012 Ethiopia	•The number of dead animals, aborted cows and number of culled animals were valued.	Dinh Xuan Tung and Nguyen Thu Thuy, 2007 Vietnam	•Value of dead animals; and culled animals estimated	Shankar et al 2012, Cambodia	•Sick and dead animals were estimated and valued for infected households.
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Reduced Weight

Rast et al 2010, Laos	Young et al 2013 Cambodia	Tum Sothyra 2006 Cambodia	Dinh Xuan Tung and Nguyen Thu Thuy, 2007 Vietnam
•Decrease in condition score used. Affected animals lost 30% or 60 kg of their weight and decreased in value by an average USD 69	•Farmers were asked to estimate the weight and value of their cattle prior to and after FMD infection	•Livestock price reductions were calculated as the difference between the price of healthy and sick animals	•Estimated value of weight loss or loss in weight gain included



Loss of Traction

Young et al 2013 Cambodia	Tum Sothyra 2006 Cambodia	Dinh Xuan Tung and Nguyen Thu Thuy, 2007 Vietnam
•Average cost of renting a replacement animal for draft for working 1 ha was USD 31.22. Cost assumes a percentage of animals used for draft. (27%)	•An average of US\$ 22.50 was spent hiring draft animals	•Estimated by multiplying the total land area to be cultivated by the local cost of preparing land



Treatment Costs

Young et al 2013 Cambodia	Tum Sothyra 2006 Cambodia	Rast et al 2010, Laos	Dinh Xuan Tung and Nguyen Thu Thuy, 2007 Vietnam
•Cost of treatment and management estimated in survey	•Cost of nursing for 14 days was used. Treatment costs ranged from US\$ 3.60 to US\$ 31.70	•Treatment costs included antibiotics, astringents and staff labor costs Treatment cost of USD 10 per animal and an estimate of 95% of animals treated.	•Value of additional labor for care of affected animals included



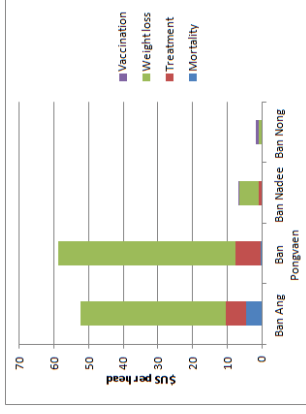
Vaccination Costs

Tum Sothyra 2006 Cambodia	Rast et al 2010, Laos	Young et al 2013 Cambodia
•Only 12.8% of respondents vaccinated. Each individual farmer spent US\$ 2.50 per vaccination	•USD 0.89 per dose, consisting of USD 0.69 for the vaccine and USD 0.20 for administration and equipment included.	•The extra cost of FMD vaccine was USD 1.22



Rast et al 2010 - Laos

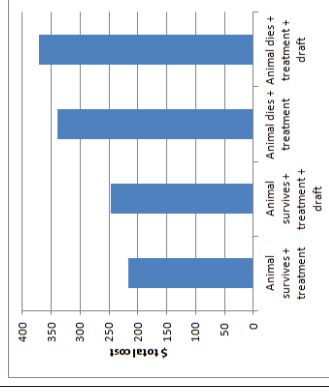
- FMD in four villages in Pek District, Laos. 2 villages no vaccination, other vaccination. VVV of each village was interviewed. 1607 animals
- Diagnosis based on clinical signs and history obtained by livestock officers trained by the research project team in disease recognition
- Morbidity rates for the fully vaccinated village were 1% and 7.9% for the partially vaccinated village, compared to two adjacent, unvaccinated villages where morbidity rates were 61% and 74.3%
- Financial losses USD 1.7–1.9 per cow or buffalo for the fully vaccinated village, and >\$59 USD in the unvaccinated villages



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Young et al 2013 - Cambodia

- 62 farmers interviewed. 320 cattle. Reported morbidity and mortality were 77.3% and 7.3%, respectively
- Farmers were asked to estimate
 - the weight and value of their cattle prior to (pre-FMD) and after FMD infection (post-FMD),
 - cost of treatment and management, disease duration, and
 - costs of draft animal replacement
- Financial losses USD 216-371 depending on outcome. Draft about \$31; weight loss + treatment accounts for half pre FMD value.



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STANDZ Funded Socio-Economic studies

- Macro-economic study to determine impacts of FMD at the National level
- Micro-economic study to determine FMD impact at Village and household level.
- Countries
 - Cambodia (Aug-Oct)
 - Lao PDR (Nov-Dec)
 - Myanmar (Feb-April)
- A separate socio-economic study in Vietnam as part of SGF – final report for submission

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Macro-economic study

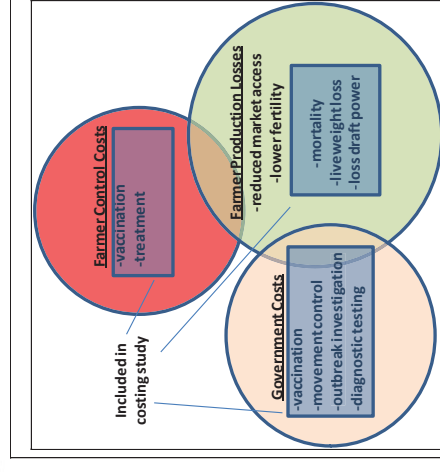


Figure 1: FMD Impacts Included in Costing Study

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Macro-economic study

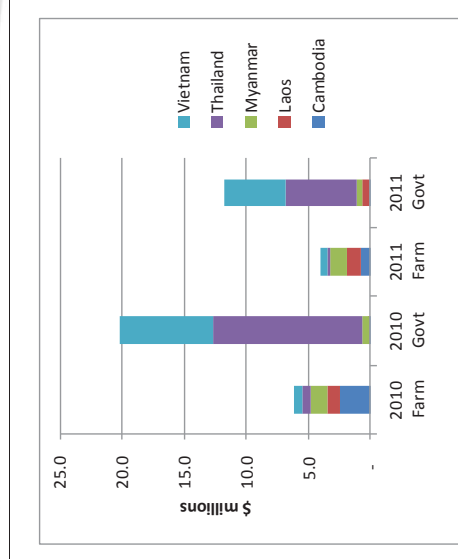


Figure 5: National FMD Costs in 2010 and 2011
Source: Consultant Estimate

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Total Costs, 2010 and 2011, Selected Asian Countries

	Cambodia	Laos	Year 2010				Total	Percent
			Myanmar	Thailand	Vietnam	Total		
Buffalo	317,238	-	-	1,442	-	318,680	1%	
Cattle	2,085,057	1,028,500	1,368,469	674,150	650,277	5,806,453	22%	
Pigs	4,422	-	-	-	4,038	8,461	0%	
Govt	131,325	12,750	514,025	12,044,625	7,519,475	20,222,200	77%	
Total	2,538,042	1,041,250	1,882,494	12,720,218	8,173,790	26,355,794	100%	
Year 2011								
Buffalo	18,992	-	-	3,546	337,492	360,029	2%	
Cattle	707,810	1,203,566	1,367,853	143,784	231,272	3,654,286	23%	
Pigs	2,874	-	-	704	41,779	45,357	0%	
Govt	118,575	527,850	508,925	5,696,100	4,947,325	11,798,775	74%	
Total	848,250	1,731,416	1,876,778	5,844,134	5,557,868	15,858,447	100%	



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Micro-economic Study

Objectives

- Estimate the direct and indirect socio-economic costs associated with the outbreaks of FMD as well as of the measures taken by farmers (coping mechanisms) to deal with the outbreaks
- Identify issues that contributed to the socio-economic impacts of FMD outbreaks and opportunities to reduce them.



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Study Team Leaders

- Cambodia – Mr Suon Seng
- Lao PDR – Mr Sonevilay Nampanya
- Myanmar – Dr Ai Thanda Kyaw



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- 12 villages were selected [6 villages in Takeo and 6 villages in Kampong Speu]
- 24 group discussions [one male and one female group discussion per village]
- 288 household questionnaires [24 questionnaires per village]
- Complemented with the collection of village and commune records, key informant interview and observation.



Data gathering



FMD Outbreaks in Villages under study

Village Name	%HH with FMD on cattle in 2013	When the first case of FMD occur in the village studied?
Takeo		
01 Tropang Kronhoung	80%	June 2013
02 Tropang Robang	70%	June 2013
03 Prey Kduoch	90%	June 2013
04 Bostaphang	90%	June 2013
05 Prey Taloy and Plov Lork	30%	August 2013
06 Tropang Skea	50%	July 2013
Kampong Speu		
07 Thnol Bort	90%	Mid-July 2013
08 Makak	95%	September 2013
09 Morn	100%	Mid-August 2013
10 Prey Veav	90%	Late June 2013
11 Dei Krohom	90%	Late May 2013
12 Prey Norea	70%	April 2013

Villages with FMD Outbreaks

N	Village Name	Nb. Family in the village	Family raise cattle	% HH have cattle infected	Nb. Cattle	% Cattle infected
1	Tropaing Kronhoung	274	239	80%	469	70%
2	Tropaing Robang	181	160	70%	518	60%
3	Prey Kduoch	573	536	90%	2128	80%
4	Bostaphang	201	150	90%	450	80%
5	Prey Taloy and Plov Lork	404	393	30%	2492	40%
6	Tropaing Skea	214	160	50%	480	50%
7	Thnol Bort	97	83	90%	270	60%
8	Makak	105	90	95%	450	40%
9	Morn	70	63	100%	213	60%
10	Prey Veav	173	150	90%	423	55%
11	Dei Krohom	201	150	90%	765	40%
12	Prey Norea	137	133	70%	546	50%



Financial Losses

Cost of time spent: harvest grasses for cattle during 15 days. 3-5 hours/day . One full-day work in rural area is 4 USD.	= 4USD * 15days/2 * % of households have cattle infected in each village
Cost of treatment: When cattle are treated with veterinary service, it cost about 8 USD per cattle.	= 8 USD/cattle * number cattle infected cattle * % cattle treatment of veterinary service.
Cost of business opportunities: Local people in the study village go to forest to harvest bamboo, construction wood, firewood...etc. They could earn 25 USD per trip. During the cattle were infected, they roughly lost 8 trips.	= 25 USD * 8 trips * numbers of households engaged in collecting bamboo, construction wood or firewood in each village
Cost of replacement of cattle work: rent motor-trailer service, it costs 40 USD per hectare. It was estimated that 75% of rice field were prepared by motor-trailer service while 25% of rice field was prepared by cattle power before cattle infected or after cattle recovered from infection.	= 40 USD * size of rice farming land in ha * % of household has cattle infected/75%

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Financial Losses

N	Village Name	Nb. Family in the village	Family raise cattle	% HH have cattle infected	Nb. Cattle	% Cattle infected	TOTAL Losses (USD)
1	Tropaing Kronhoung	274	239	80%	469	70%	21,474
2	Tropaing Robang	181	160	70%	518	60%	12,290
3	Prey Kduoch	573	536	90%	2128	80%	72,681
4	Bostaphang	201	150	90%	450	80%	17,063
5	Prey Taloy and Plov Lork	404	393	30%	2492	40%	12,619
6	Tropaing Skea	214	160	50%	480	50%	18,210
7	Thnol Bort	97	83	90%	270	60%	9,002
8	Makak	105	90	95%	450	40%	13,546
9	Morn	70	63	100%	213	60%	6,901
10	Prey Veav	173	150	90%	423	55%	10,502
11	Dey Krohom	201	150	90%	765	40%	11,108
12	Prey Norea	137	133	70%	546	50%	10,925

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Financial Losses

	Time spent	Treatment	Business opportunity	Replacement of cattle labor	TOTAL Losses (USD)
1Tropaing Kronhoung	5,736	1,366	4,589	9,783	21,474
2Tropaing Robang	3,360	1,293	2,352	5,285	12,290
3Prey Kduoch	14,472	7,082	13,025	38,102	72,681
4Bostaphang	4,050	1,838	3,645	7,530	17,063
5Prey Taloy and Plov Lork	3,537	1,740	2,122	5,220	12,619
6Tropaing Skea	2,400	9,533	2,160	4,117	18,210
7Thnol Bort	2,241	2,016	1,569	3,176	9,002
8Makak	2,565	5,582	1,796	3,603	13,546
9Morn	1,890	1,344	1,323	2,344	6,901
10Prey Veav	4,050	648	2,025	3,779	10,502
11Dey Krohom	4,050	720	2,430	3,908	11,108
12Prey Norea	2,793	511	2,514	5,107	10,925
Total	51,144	27,180	39,549	91,953	209,826

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Impacts on genders and children from FMD outbreak



No	Activities In Takeo province	Adult man	Adult woman	Boy	Girl
	In a normal period				
	Harvest grass	45%	30%	15%	10%
	Bring to field	40%	30%	15%	15%
	Scavenging	25%	10%	45%	20%
	Washing	85%	10%	5%	0%
	Clean cage	25%	50%	15%	10%
	During FMD				
	Clean mouth	88%	12%	0%	0%
	Clean feet	85%	15%	0%	0%
	Force to eat	75%	23%	16%	0%
	Call vet	55%	35%	5%	5%
	Bring to muddy	35%	25%	20%	20%

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Impacts on genders and children from FMD outbreak



Activities In Kampong Speu province	Adult man	Adult woman	Boy	Girl
In a normal period				
Harvest grass	40%	30%	20%	10%
Bring to field	45%	20%	25%	10%
Scavenging	30%	5%	50%	15%
Washing	70%	20%	10%	0%
Clean cage	30%	40%	15%	15%
During FMD				
Clean mouth	80%	20%	0%	0%
Clean feet	60%	30%	10%	0%
Force to eat	60%	40%	0%	0%
Call vet	60%	40%	0%	0%
Bring to muddy	50%	20%	15%	15%

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Lao PDR Study



- 12 villages were selected [6 villages in Luang Namtha, 2 in Bokeo and 4 Savannakhet]
- 12 village group meetings group
- 124 household questionnaires
- study used a mix of participatory tools at the village level and survey questionnaire at household level



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Village Data

Variables	Lowland	Upland	Overall
Surveyed location			
No. interviewed district	2	2	4
No. interviewed village	4	8	12
No. interviewed farmer	61	63	124
No. interviewed female farmers	24	17	41
Mean size of interviewed farmers (years)	50 (±12.4)	48 (±12.7)	49 (±12.5)
Mean size of farmer hh. (pers./hh)	7 (±2.2)	6 (±2.2)	7 (±2.4)
Mean no. females in hh. (pers./hh)	4 (±1.8)	3 (±1.4)	3 (±1.6)
Primary large ruminant caretaker			
Female	13 (21%)	14 (22%)	27 (22%)
Male	48 (79%)	49 (78%)	97 (78%)
Rice production			
Grow rice in paddy field (%)	95	88	90
Rice produced (Tone/hh)	4.9 (±2.7)	4.7 (±2.3)	4.8 (±2.5)
Cultivated areas (ha/hh)	2.5 (±1.6)	1.3 (±0.6)	1.9 (±1.3)
Produce enough rice to hh (%)	82	87	85
Number of large ruminants (head/hh)			
Total	12 (±11.5)	9 (±6.9)	10 (±9.6)
Female cattle and buffalo	7 (±7.7)	6 (±4.6)	7 (±6.3)
Cattle	9 (±9.2)	7 (±6.3)	8 (±7.8)
Cow	5 (±5.2)	5 (±4.7)	5 (±4.9)

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Financial Losses to FMD Outbreaks

No	Village name	Province	No. total household (hh) in the village	Catt/buff raising No. hh with cattle and buffalo affected	% hh with FMD-affected	Cattle and buffalo in village	% cattle and buffalo affected	Total Losses (USD)
1	Tin Thad	Luang Namtha	247	37	16	462	13	5,412
2	Nong Kham	Luang Namtha	90	9	100	183	77	8,118
3	Yang Pheng	Luang Namtha	69	58	45	198	38	23,452
4	Xiang Lee	Luang Namtha	70	6	67	48	67	3,608
5	Xiang Chai	Luang Namtha	147	8	62	53	43	4,510
6	Pi Yee	Luang Namtha	158	43	100	330	80	36,786
7	Namyon May Bokeo	Bokeo	200	96	42	610	45	36,080
8	Lao Luang	Bokeo	135	80	68	254	78	49,610
9	Dongmakyan	Savannakhet	180	80	47	514	42	8,512
10	Som Sa Ad	Savannakhet	241	211	70	487	56	33,152
11	Xe	Savannakhet	338	220	25	1720	30	12,544
12	Lakmoung	Savannakhet	237	47	85	324	72	8,960
								TOTAL
								232,744

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FMD Status in study areas

Province / year affected	No. district	No. affected district	No. village	No. affected village	Time of outbreaks	No. sick cattle	No. sick buffalo	No. dead cattle	No. dead buffalo
2011 SVK	15	15: All	867	-	Jan-Mar Dec	1,707	415	174	68
2012 BK	5	1: Houayxai	283	4	Nov-Dec	104	-	2	-
LNT	5	1: Sing	356	14	Nov-Dec	108	-	5	-
2013 BK	5	1: Houayxai	283	3	Mar	17	-	-	-
LNT	5	1: LNT	356	4	Mar	42	-	-	-
XYL	11	1: Pakkai	448	7	Mar	233	-	9	-

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Household losses

Variables	Region category		p-value	Livestock caretaker category		p-value
	Lowland	Upland		Female	Male	
Annual household income (USD/hh)	522 (±233)	1,563 (±226)	0.01	985 (±228)	1,000 (±135)	0.2
Cropping	115 (±14.1)	141 (±25.1)		142 (±217)	124 (±201)	
Small animals*	985 (±177)	1,040 (±172)	0.8	932 (±135)	1,007 (±126)	0.7
Large ruminants	1,445 (±170)	284 (±166)	<0.001	718 (±173)	895 (±102)	0.4
Others	3,001 (±331)	3,057 (±322)	0.9	2,789 (±314)	3,032 (±186)	0.3
Total income	3 (±0.5)	3 (±0.5)	0.6	3 (±0.5)	3 (±0.3)	0.7
Large ruminant sale in 2013 (heads/hh)	7 (±1.1)	9 (±1.1)	0.2	8 (±1.1)	8 (±1.1)	0.9
Large ruminants prior to FMD (head/hh)	2 (±1.2)	7 (±1.1)	<0.001	4 (±1.1)	4 (±1.1)	0.6
Mean large ruminants	0 (±0.4)	0 (±0.5)		0 (±0.6)	0 (±0.5)	
Mean infected animals	6 (±1)	6 (±1)	0.9	6 (±1)	6 (±1)	0.8
Mean animals died from FMD*	17 (±5)	40 (±5)	<0.001	28 (±4)	23 (±3)	0.4
Treatment cost per animal (USD/animal)	208 (±91)	807 (±86)	<0.001	507 (±81)	508 (±48)	0.9
Mortality loss (USD/hh)	0 (±56)	0 (±89)		0 (±89)	0 (±69)	
Total loss (USD/hh)	224 (±94)	902 (±88)	<0.001	574 (±83)	551 (±49)	0.8
Total loss and income from large ruminants (%)	23	86		61	55	

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Myanmar Study

- 6 villages in Mandalay
- 6 villages in Sagaing
- Focus group discussion and household questionnaires
- Field study – mid-March to April 2014
- Results currently being revised and refined



Myanmar Study

Study areas	Selected Township	Selected villages
Sagaing Area	Ye-Oo Khin-Oo Monywa	Ywa Thit village
		Chan Thar village
		Min Ywar village
		Nyaung Gyone village
		Kywe Ye village
Mandalay Area	Myitha Amarapura Kyaukse	Thaystkan village
		Yit Kan village
		Leippan village
		Ye Ywar village
		Ywa Monte Cyi village
		Taung Gyate village
		Ashae Taw Village



Data gathering



Conclusions

- Impact of FMD substantial in studied areas, particularly at village level
- Variations between countries, particularly due to differing uses for cattle
- Participation between all levels necessary for FMD control



Thank you for your attention!



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Outline of Presentation

FMD Status

Control Activities

Constraints

Future Activities



Country Report for FMD Control In China

Dr. Chen guosheng

Veterinary Bureau,

Ministry of Agriculture, P. R. China



FMD Status

Jan-Dec, 2013

- 6 outbreaks of Type O
- 17 outbreak of Type A
- 1298 animals infected
- 11,068 animals culled

Jan-Sep., 2014

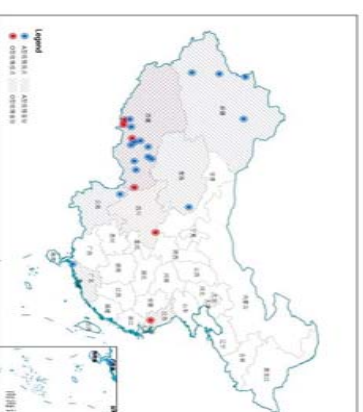
- 1 Type O outbreaks
- 3 Type A outbreaks
- 19 animals infected
- 105 animals culled

- Epidemic status: distributed, localized
- 2 serotypes: A and O
- 3 Strains: A/Sea-97 O/Mya-98 O/PanAsia

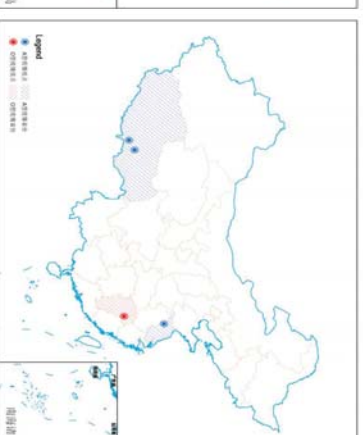


FMD Status

Review: FMD in China
(From Jan. to Dec. 2013)

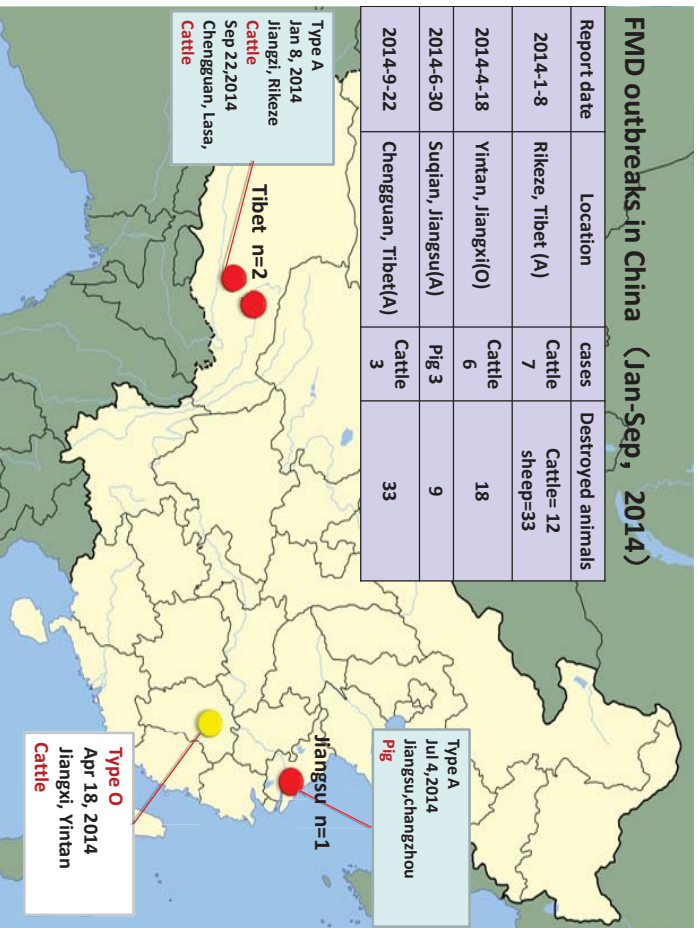


FMD in China
(From Jan to sep. 2014)

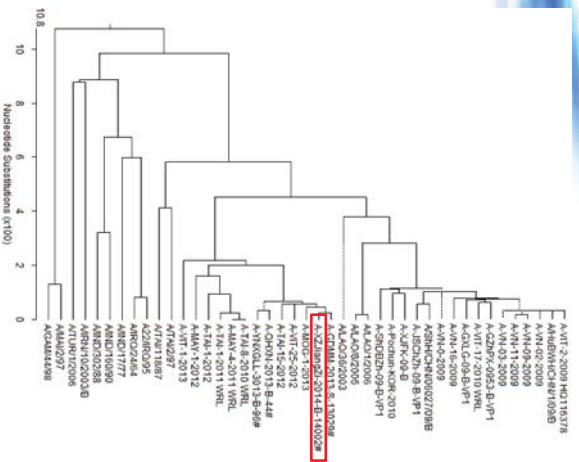


FMD outbreaks in China (Jan-Sep, 2014)

Report date	Location	cases	Destroyed animals
2014-1-8	Rikeze, Tibet (A)	Cattle 7	Cattle= 12 sheep=33
2014-4-18	Yintan, Jiangxi(O)	Cattle 6	18
2014-6-30	Suqian, Jiangsu(A)	Pig 3	9
2014-9-22	Chengguan, Tibet(A)	Cattle 3	33

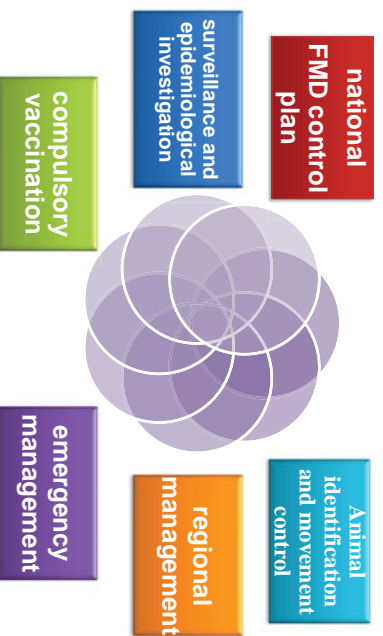


MOLECULAR EPIDEMIOLOGY ANALYSIS



- **A/Sea-97 strain**
- Located on the other genetic branch(named G2)
- ---- new virus : which is different from strains reported in 2009
- low genetic relationship with the virus(named G1) found in China in 2009: about 91% identity
- Shared close relationship with viruses from SEA nations past two years: over 98% homology
- also very close relationship with the sequences from China, RUS, KAZ, MOG
- FMDVs from SEA nations are appearing in East Asia continuously.
- What is driving?
- Regional joint prevention and control

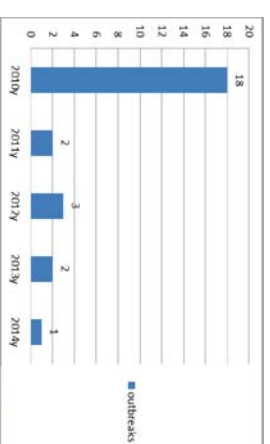
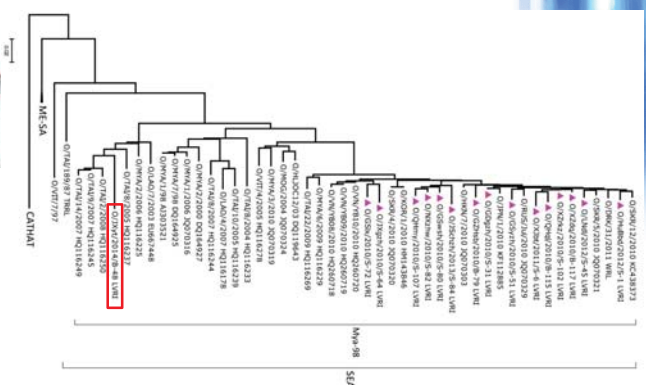
National Action Plan



Technical Activities

Analysis on O/Mya-98 strains

- Firstly found in 2010 in China;
- Came from SEA nations ;
- One of predominant strains in China;
- Total 26 cases reported;
- Outbreaks are on the decline;
- Vaccines used in China are effective for the strains.



Technical Activities

National Action Plan

National Medium and Long-Term Program for Animal Disease Control (2012-2020)

国务院办公厅文件

国办发〔2012〕31号

国务院办公厅关于印发国家中长期动物疫病防治规划（2012—2020年）的通知

各省、自治区、直辖市人民政府，国务院各部委，各直属机构：《国家中长期动物疫病防治规划（2012—2020年）》已经国务院同意，现印发给你们，请认真贯彻执行。



Sero-type	By 2015	By 2020
A type	Nation-wide no clinical cases	Nation-wide disease freedom with vaccination
Asia-I type	Nation-wide disease freedom with vaccination	Nation-wide disease freedom without vaccination
Otype	FMD freedom without vaccination in Hainan Island; FMD freedom with vaccination in liaotung peninsula and Shandong Peninsula; Controlled in the rest	FMD freedom with vaccination in Hainan Island, Liaotung peninsula and Shandong Peninsula; FMD freedom with vaccination in Beijing, Tianjin, Liaoning, jilin, Heilongjiang and Shanghai; Controlled in the rest

Technical Activities

Monitoring & Evaluation

– FMD Surveillance in the first half of 2014

Year	Number of serum samples (unit: million)	Number of pathogen samples (unit: million)	Number of positive samples
2012	3.6	~0.3	11
2013	3.5	~0.4	24
2014 Jan-Jun	1.16	~0.13	0

The pathologically positive animals were handled immediately according to relevant regulations.

Technical Activities

National Action Plan

- MOA released 2 updated Annual National Plans on compulsory vaccination, surveillance and epidemiological investigation
- MOA held National Working Conference twice a year (spring & autumn) and Situation Analysis Meeting at pretty irregular intervals

农业部文件

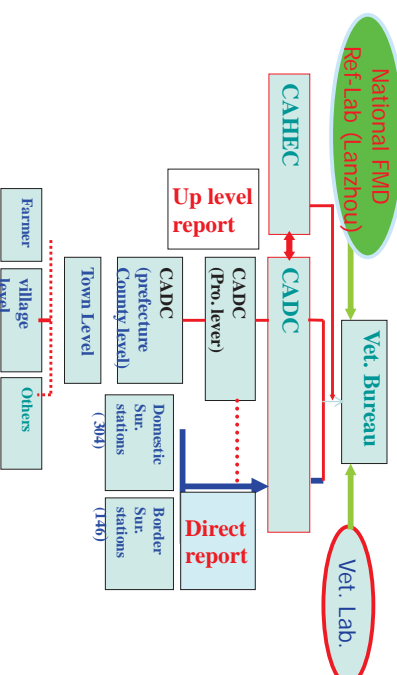
农业部文件



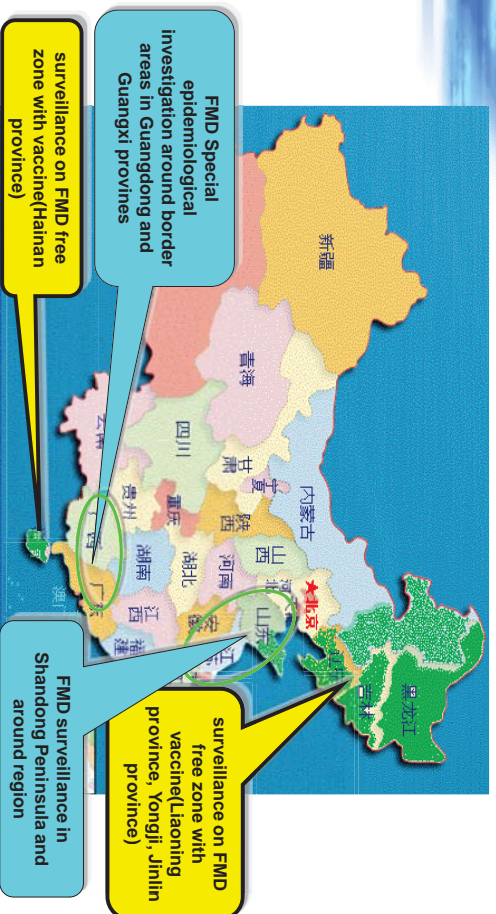
Technical Activities

- Rapid identification of FMD foci of infection

Monitoring Systems



the active surveillance during 2014

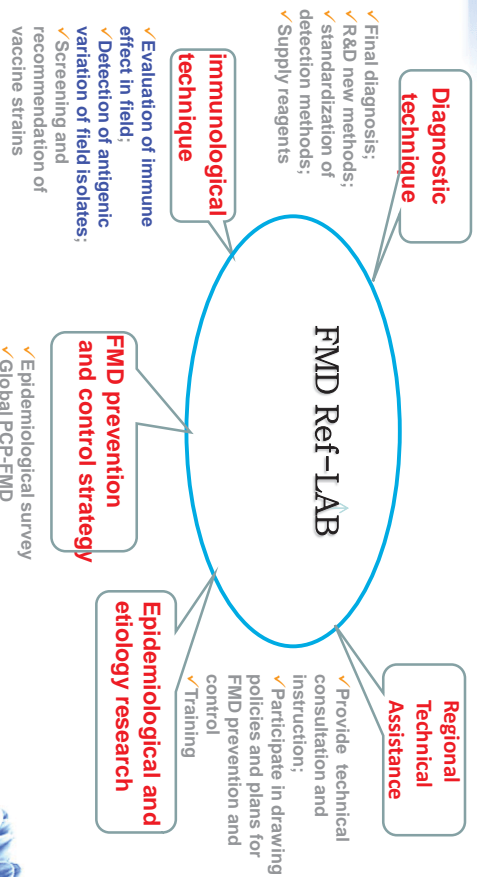


Asia1 surveillance all of the country for evaluating of vaccine
FMD surveillance on pig slaughterhouses in 12 provinces



Technical Activities

Main Roles of OIE/CN FMD Ref-Lab



OIE/China National FMD Ref-Lab

- Founded in 1958;
- Renamed as NFMDRL by MOA of China in 2002
- OIE FMDRL in May, 2011
- **10 working or research groups, 65staff, more than 100 scientists, visiting scholars, and graduates studying**



Prof. Xiangqiao Liu

OIE/China National FMD Ref-Lab, formerly known as the FMD Research Group under Lanzhou Veterinary Research Institute of Chinese Academy of Agricultural Sciences (LVRI, CAAS), formed in 2002 according to instruction from MOA of P.R China. In 2011, the World Assembly of Delegates of the OIE confirmed the designation of LVRI as a new OIE Ref-Lab for FMD.



Brief Introduction on current activities and achievements at OIE/China National FMD Reference Laboratory

- **Scientific Research**
 - Epidemiological Studies
 - Hot Spots Research on applied basic research
 - Novel FMD Vaccines Research
 - Diagnostic testing technology research
- **Active surveillance**
 - Find the threaten strains timely, such as O/Mya-98, A/Sea-97 strain and Asia1/JSL/06
- **Vaccine Strains Recommendation**
 - Asia1/JSL/06, Collected and screened in 2006, as a vaccine strains from 2007, No Asia1 cases for 4 years
 - O/Mya-98
 - A/Sea-97



Brief Introduction on current activities and achievements at
OIE/China National FMD Reference Laboratory

Regional Technical Assistance

- FMD diagnosis technology Support
- Reagents provided
- Training courses on prevention and control FMD



Technical Activities

Zoning-based administration

- ✓ The Management Rules on Evaluation of disease Free Zones (DFZs)
- ✓ The Technical Code on Management of DFZs

Establishing and expanding DFZs with or without vaccination through high-quality compulsory vaccination, strict movement control, continuous surveillance and shrinking of the population of positive animals, etc.

"DFZ with vaccination in Big North-East Region"
(Including Heilongjiang, Jilin, Liaoning and Inner Mongolia)



Constraints

- ✓ Traditional farming models
For example, in the pig farming sector, 65% are backyard or non-specialized farms (less than 500 pigs/ yr). High densities, poor security condition and poor management are huge health hazards.
- ✓ Frequent inter-provincial live animals movement
Refer to public traditional consumption custom, live animals are frequently transported for long distances.
- ✓ Capacity of local veterinarian teams and stakeholders
Only a few village disease control workers have a professional background. Participation of stakeholders is insufficient.



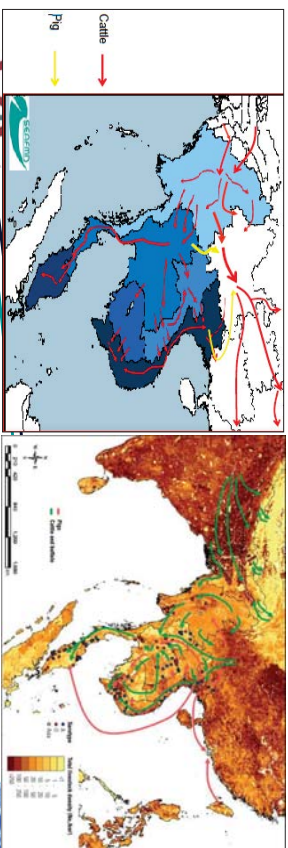
Constraints

✓ FMDV spread

Cross-border animal mobile management,

especially in Yunnan, Guangxi, Inner Mongolia and Xinjiang provinces

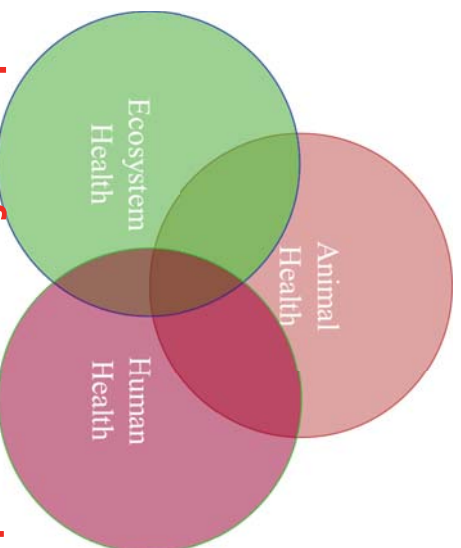
- Value chain and network analysis
- Special epi. investigation around borders areas



Future Activities

- Enhance the driving force to the implementation of “the National Plan”
 - e.g. Zoning-based control strategy
- Strengthen the management of FMD cross-border spread risk
 - e.g. FMD types not existing in China (C and SAT1/2/3),
- Strengthen the cooperation and coordination

OIE



Thank you for your attention!

OIE

Country Presentation

[FMD Status, FMD Control and Updated PCP Status]

Yang, Wen-Yuan

2014.9.24

Bureau of Animal and Plant Health Inspection and Quarantine,
Council of Agriculture
(BAPHIQ)

2014/9/24

1

General Aspects¹

- Livestock population in 2014

Species	Buffaloes	Cattle	Goats	Sheep	Deer	Pigs	Total
Number	2,239	145,869	164,633	380	21,571	5,422,399	5,757,091

Unit: Head

- Pigs are the main population of livestock.



84% of swine population locates in south-western part of Taiwan

2013/11/07

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Outline

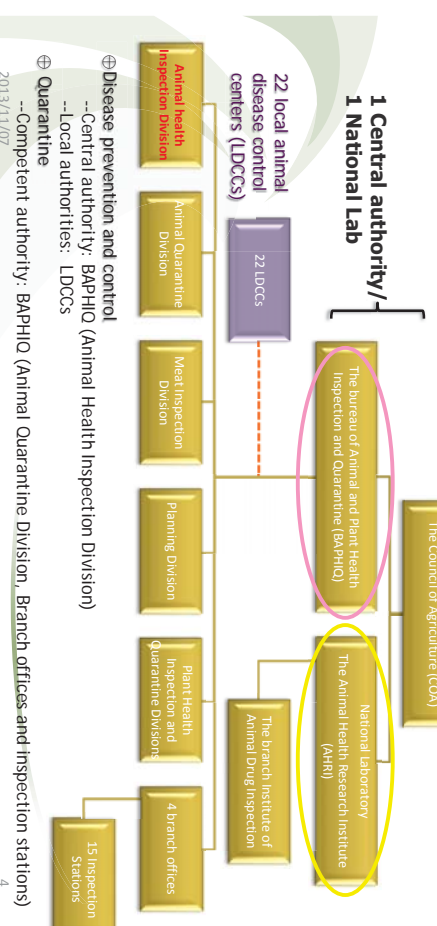
- General Aspects
- FMD Status
- FMD Control
- Updated PCP Status

2013/11/07

2

General Aspects²

Veterinary services and infrastructure



2013/11/07

4

General Aspects³

- **FMD prevention and control :**
 - In accordance with:
 - *Statute for Prevention and Control of Infectious Animal Disease* (law)
 - *Regulations on Management of Vaccine Types for HC and FMD Elimination* (regulation)
- **Goal:**
 - Over 90% of the susceptible population be adequately immunized
 - >80% of cloven-hoofed animal farms with vaccination reach the protection level of immunity (SN Ab \geq 16 in pigs; \geq 32 in ruminants)
 - To return to FMD free country with vaccination in 2015, finally to FMD free country without vaccination

2013/11/07

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FMD Status: 2002-2014

- No case was reported and detected from 2002 to 2008
 - 2009-2013:
 - O-Cathay FMDV (predominated)
 - O-SEA FMDV invaded in 2012
- NSP case: NSP(+), Ag PCR(-) and VI(-)
Viral case: NSP(-), Ag PCR(+) or VI(+)

Year	2009		2010		2011		2012		2013 (Jan-May)	
	NSP	Viral	NSP	Viral	NSP	Viral	NSP	Viral	NSP	Viral
Case Number	5	3	3	1	7	4	10	5	3	0
Total	8		4		11		15		3	

- No case was detected/ observed since June 2013

2013/11/07

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FMD Status: 1997-2001

- Devastating outbreaks in 1997
 - Serotype O
 - Cathay topotype FMDV (Pig adopted strain)
 - the predominated FMDV till now
 - Pigs
- Outbreaks of the new strain in 1999-2000
 - Serotype O
 - Pan Asia topotype FMDV
 - Yellow cattle, diary cattle and goats
- Sporadic outbreaks were reported in 1998-2001
 - O-Cathay FMDV

2013/11/07

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FMD Control

- **Blanket vaccination**
- **Surveillance**
 - Evaluation of vaccination efficacy (SN titer)
 - Detection of the suspect case
 - Clinical sign
 - NSP Ab
- **Preventive measures**
- **Case control**
- **Stockpile for emergency use of other serotype of FMDV**

2014/9/24

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Blanket Vaccination

- **Blanket vaccination**
 - Empowered by Statute for Prevention and Control of Infectious Animal Disease
 - All cloven-hoofed animals shall be vaccinated with FMD vaccine
 - O Taiwan and O campos strain vaccines (at least 6 PD₅₀) are used (IM route)



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Blanket Vaccination

- **Penalty:**
 - The owner or keeper will be fined NTD 10,000-50,000 for
 - violation of compulsory vaccination
 - tested animals with mean titer of FMD SN antibodies ≤ 4
 - The owner or keeper shall make a booster to animals kept in the farm when
 - mean titer of FMD SN antibodies from tested animals is < 16 , or
 - mean titer of FMD SN antibodies from tested animals is ≤ 4
 - The boosted shall be re-tested after 3-5 weeks to ensure herd level protection

2013/11/07

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Blanket Vaccination

- **Vaccination program**
 - Empowered by Regulations on Management of Vaccine Types for HC and FMD Elimination
 - **Pigs:**
 - One dose is given at 12-14wks age and another one is vaccinated once half a year
 - **Ruminants (cattle, goats and deer):**
 - Basic vaccination shall be done at 4 and 12 months age respectively. Then the other one dose is given once a year
- Anti- violating operation is conducted by the verification team on daily basis

2013/11/07

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Surveillance

- **Active surveillance**
 - SN titer
 - evaluating the efficacy of blanket vaccination
 - SN mean titer value for herd level protection
 - $\geq 16x$ in pigs.
 - $\geq 32x$ in ruminants.
 - The testing results below the standard values link to the corresponding penalty.
 - **NSP antibody**
 - to detect possible viral activity in the field.

2013/11/07

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Surveillance

- On-farm active surveillance
 - Clinical inspection
 - Serological testing
 - Stratified random sampling
 - 95% probability, 20% prevalence
 - 600 pig farms/year
 - 300 ruminant farms/year
 - 15 serum samples/farm.
- The achievements in Jan-Aug, 2014
 - 80.45% of tested pig farms had mean SN titer $\geq 16x$
 - 93.33% of tested ruminant farms had mean SN titer $\geq 32x$

2013/11/07

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Prevention Measures

- Application of biosecurity principles at the farm level
 - onto and off farms control
 - Personal and vehicle biosecurity
 - Changing outer clothes and footwear when moving between different pens and age groups, with the frequent use of disinfection baths and separate equipment, minimizes the spread of infectious diseases
 - Routine cleaning and disinfection
 - Selective purchasing and quarantine
 - The origin of newly acquired animals should be known as healthy. Recently purchased animals should be quarantined at a distance from the remainder of the herd for a period of 14 days to provide added security.
 - Self monitoring and reporting the suspect case

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Surveillance

- Meat markets surveillance
 - Clinical inspection
 - Serological testing for NSP antibody on daily basis
 - 1-2 animals per original farm
 - 40-50 thousands samples/year
 - Clinically suspected case shall be traced back to the original farm to conduct
 - movement restriction
 - follow-up serological and virological sampling
 - NSP(+) or Antigen(+)--case control
 - SN \leq protection level, NSP(-) and Antigen(-)---booster of vaccine, lift of restriction
 - SN \geq protection level, NSP(-) and Antigen(-)----lift of restriction

2013/11/07

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Prevention Measures

- Application of vehicles control, transportation vehicle and establishment disinfection at auction markets and slaughterhouses
 - Supervised by LDCGs and veterinary meat inspectors
- Awareness program and education on farmers and stakeholders



2014/9/24

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Case Control

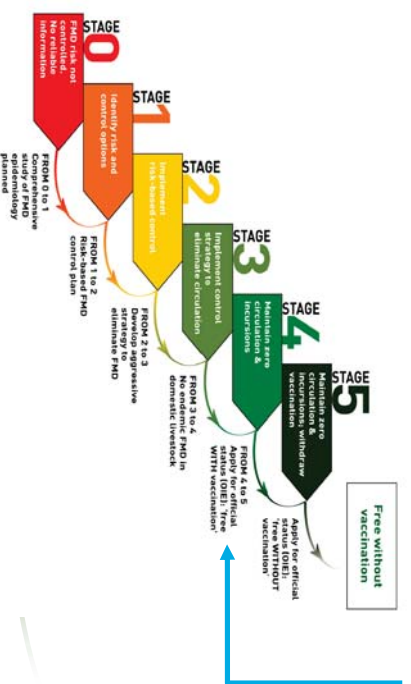
- Movement restriction on the infected farm
- Culling of clinically infected animals and their pen mates (exposed animals)
- Disposal of carcasses
- Vaccination of healthy animals within the infected farm to improve the herd level protection.
- Surveillance on surrounding cloven-hoofed animal farms within 3 km radius area around the infected farm.

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Updated PCP Status

	2011/12	2012/13	2013/14	2014/2015	2015/16
Stage	3	3	3	4	4/5



2014/9/24

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Stockpile for Emergency Use of Other Serotype of FMDV

- Serotype: A, Asia-1 and O
- Commercial vaccines:
 - Monovalent
 - 100,000 doses/ each serotype
- Antigen bank:
 - Monovalent
 - 750,000 doses/ each serotype

2013/11/07

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Thanks for your attention

2013/11/07

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Epidemiological characteristics and emergency measures of foot –and mouth disease occurred in DPR. Korea in 2014

presented by Hong Thae Sik

Emergency measures for FMD control in DPR. Korea

- When FMD occurred, national state of emergency was declared
- Control of FMD were implemented by veterinary anti-epidemic measures
- By the end of May 2014, DPR. Korea finished providing susceptible animals with O type vaccines supplied by OIE
- FMD vaccines supplied by China will be inoculated in October 2014

Circumstances for the outbreak of FMD in DPR. Korea in 2014

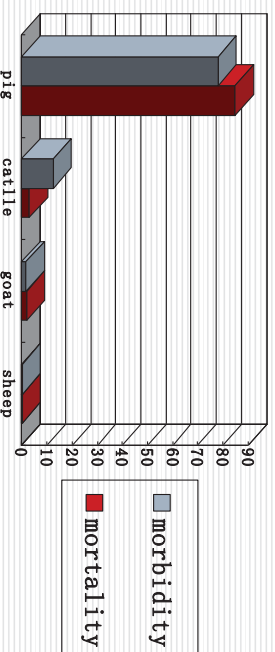
- The first outbreak of FMD in pig in Dok dong farm, Pyong Yang city in January 2014
- The outbreak of FMD O type mainly in pigs of 34 farms of 8 of cities or counties in 3 of provinces from January to March 2014
- The outbreak of FMD O type only in cattles in Jong Song farm, Chol Won city, Kang Won province in march 2014

Strategy of DPR. Korea for control FMD

- in which diagnosis capacity is strengthened and vaccine strain selection techniques are improved
- Acquired techniques and anti-epidemic measures are introduced in the farms and more improved
- In control phase, Vaccination is practiced
- Consolidation phase, In which gain are maintained, further restructuring of the industry is undertaken, farms demonstrate freedom from FMD, disease free compartment are expanded
- Eradication phase, in In which freedom from disease is achieved on a national or sectoral basis

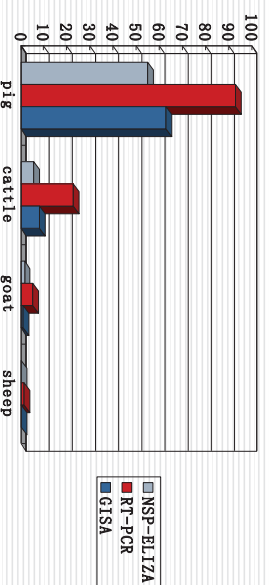
Morbidity and mortality of FMD according to animal species

- The outbreak of FMD occurred mainly in pigs in 2014
- The outbreak of FMD in cattle, goat, sheep was very limited



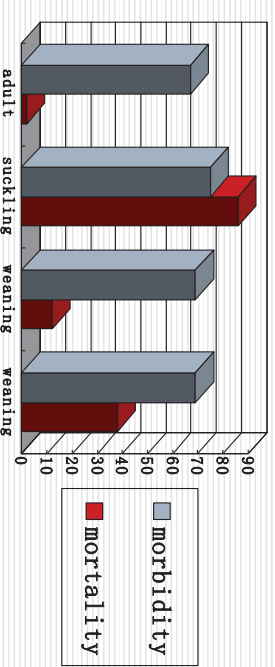
Percentage of infection according to animal species confirmed by tests in FMD occurred area

- Percentage of infection in pig was high but cattle, goat, sheep low
- Sensitivity according to the kinds of test was different



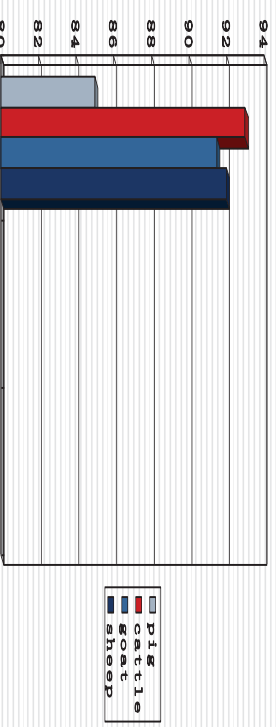
Morbidity and mortality of FMD according to ages of pigs

Morbidity of FMD was up to 45~68% in the pigs but mortality of FMD was 80~90% in the suckling piglets and 12% in the weaning piglets. With passing the course of disease, mortality of FMD was increased 30~40 in weaning piglets.



Vaccine trial

- In pilot vaccination campaign, more than 90% of animals were seropositive and in the main vaccination campaign more than 85% of animals were seropositive



Discussion

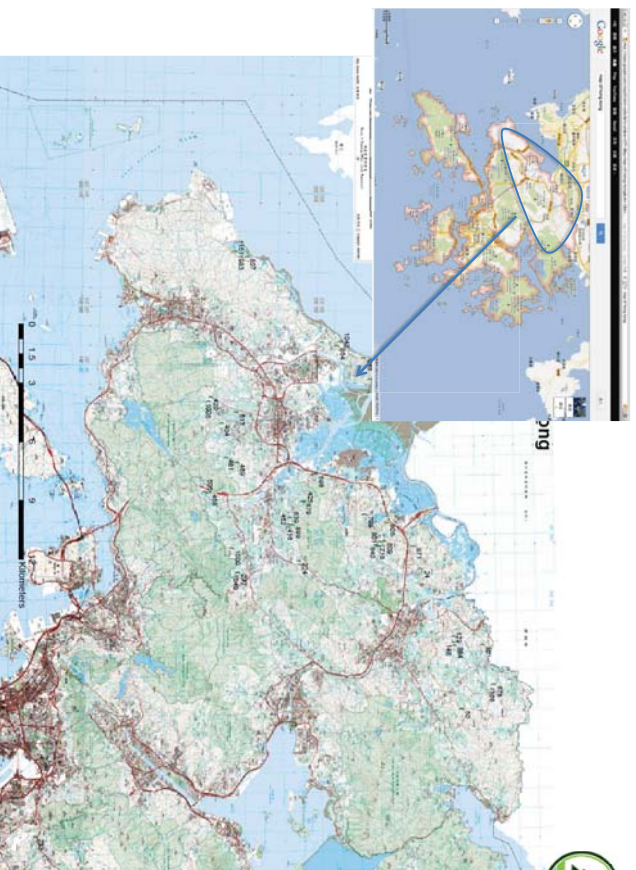
- ❑ The outbreak of FMD O sero type in 2014 occurred mainly in pigs but cattle, goat and sheep was very limited
 - ❑ Dissemination of FMDV is more likely to be depended on seasons in DPR. Korea
 - ❑ Vaccination of FMD for susceptible animals has effectiveness to stop re-infections and decrease economic losses
 - ❑ In DPR. Korea, Control of FMD has been implemented by veterinary anti-epidemic measures and vaccination so far.
-

Thank you

Foot and Mouth Disease Hong Kong Situation Update



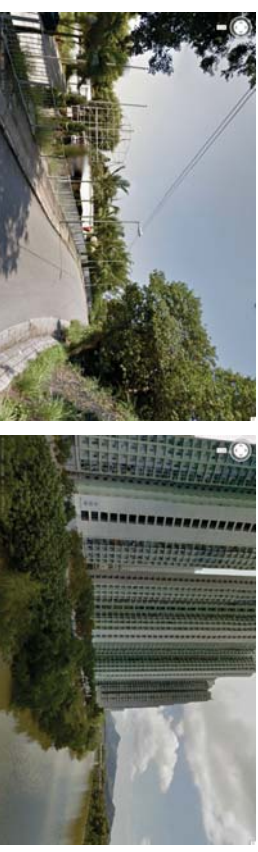
Dr. May TSE
Veterinary Officer
Agriculture, Fisheries and Conservation Department
24-25 Sept 2014



Background



- Hong Kong currently has 43 pig farms
- A total population of around 60000 pigs
- Small to medium sized farms
- FMD is endemic in Hong Kong



Local control



- Local farms visited at least on a monthly basis
- One farm a day
- Passive surveillance



Import control



- All pig breeding stocks are imported from the Mainland

Year	2010	2011	2012	2013	2014 (up till June)
Total Quantity (head)	1477	1281	1158	1586	635

Import control



- Certified that the imported pigs were free from FMD in the last 12 months
- Quarantine period for breeding pigs on local farm is 28 days after importation



FMD in Hong Kong



- FMD is a notifiable disease in Hong Kong under Cap 139B Public Health (Animals and Birds) Ordinance
- Report to OIE



Disease status



Year	2010	2011	2012	2013	2014/2014 (up till June)
No. of cases	4	3	1	1	2
Location	New Territories	New Territories	New Territories	New Territories	New Territories
Species / Serotype	Pig/FMDV-O	Pig/FMDV-O	Pig/FMDV-O	Pig/FMDV-O	Pig/FMDV-O

Control strategy



- FMD is endemic in Hong Kong
- Currently, we rely on vaccination and biosecurity to prevent and control FMD



Post Outbreak Investigation



- Sampling
- Serotyping of field strain
- Education and advice for farmers
- Vaccine recommendations based on vaccine matching results from Institute for Animal Health (IAH) Pirbright

Outbreak



- Disease diagnosis
 - Samples (vesicular epithelium or vesicular fluid) will be taken and submitted to Tai Lung Veterinary Laboratory
 - In case of dead pig, carcass will be submitted for necropsy
- Mass vaccination with Serotype O
- Biosecurity advice
 - Movement and access control
 - Foot baths etc.

Circulating strain and Vaccine update



- Result of vaccine matching of a positive case in Feb 2014 suggested that both O1 Manisa and O-3039 strains in the original FMD vaccine (AFTOPOR) were not protective against the isolate
- In the meeting with the vaccine manufacturer, they suggested and agreed adding one more vaccine strain — O-4720 to make AFTOPOR better efficacy and potency against the circulating strain
- The new vaccine had been dispatched to HK in the end of Aug



Status

- Vaccination practice (mass vaccination) is effective in the control and prevention of large FMD outbreaks on farm



Constraints

- No downtime and mixed sources in the slaughterhouse
- Movement of pigs and dealers' vehicles between slaughterhouse and local farms increased the chance of cross contamination
- On farm quarantine and biosecurity practice



Thank you

Veterinary and animal breeding agency Implementing Agency of Mongolian Government



FMD situation in Mongolia

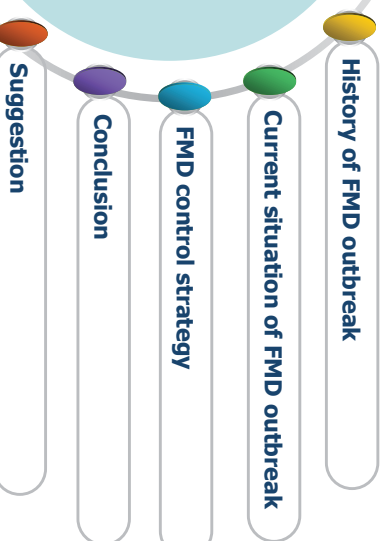
www.dvab.gov.mn

BATSUKH Basan
Officer of Trans-boundary animal diseases and Foreign relations of

Veterinary and animal breeding agency
Implementing Agency of Mongolian Government

Third Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia

Content



Third Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia

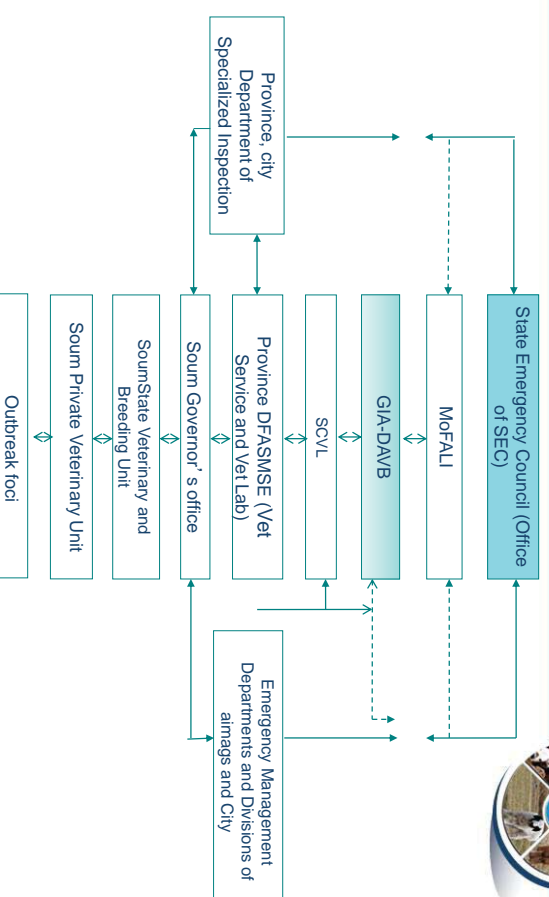
Legislation environment for FMD control



- ❖ Law of June 7th, 1993, on 'Livestock Health and Gene Potection Law' change Animal Health law draft) ;
- ❖ Law of June 20th, 2003 on 'Disaster Protection' ;
- ❖ Law of December 1st, 2005, on 'Procurement of Goods, Works and Services with State and Local Funds' ;
- ❖ Drugs Act of May 7th, 1998, Law of Mongolia ;
- ❖ Law of November 28th, 2003, on 'State Boundary Quarantine Control of Animals, Plants, Raw Materials and Products of Animal and Plant Origin' ;
- ❖ Government Decree No 305 of July 29th, 2008, 'Procedure on Confirmation of Highly Infectious Animal Disease, Establish Quarantine and Restriction Zones, Operations in these Zones' ;
- ❖ Ministerial Decree No A/67, Annex 1, of April 5th, 2010, from Minister of Food, Agriculture and Light Industry, 'Guideline on FMD Control Measures;
- ❖ Foot and mouth disease national contingency plan, 2011 (under processing) ;
- ❖ Foot and mouth disease control strategy, 2013-2017 (under processing) ;

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Organizations responsible for FMD prevention and control



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Responsibility of organisations on FMD prevention and control



- **Veterinary Service, MoIA**
- **Disease diagnosis and confirmation;**
- **Work out control strategies in accordance with OIE rule and specificity of livestock husbandry system in different geographical zones;**
- **Implementation of control measures;**
- **Emergency Management Agency**
- **Harmonize all control actions in line with MoAI and SSIA guidance;**
- **Mobilize forces of military, police and civil contingent;**
- **Assign required fund for control;**
- **Assist local authorities in disease controlling;**
- **State Specialized Inspection Service**
- **Issue degree of designating the quarantine zones;**
- **Inspection over implementation of control measure;**

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Timing and number of FMD outbreaks /2000-2014/



Year/month	2000	2001	2002	2003	2004	2005	2006	2010	2013	2014
January										11
February		19			13					1
March		4			5					1
April		1	1		2		1	1		
May		1	1					1		
June								1		
July			3							1
August							1	2		
September								11	1	
October								2		
November								6		
December										
TOTAL	2	25	3	0	20	1	1	24	2	13

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FMD outbreak history



- ❑ **First period: 1931 ~ 1935,**
- ❑ **Second period: 1941 ~ 1948,**
- ❑ **Third period: 1963 ~ 1974, (O and A)**
 - Control movement, disinfection and by artificial infection;
 - No cases of FMD since 1974, until June 2000;
- ❑ **Fourth period: 2000 ~ 2010 (O and Asia-1),**
 - Control movement, disinfection, eradication and control, and vaccination, stamping out, public awareness, collaboration OIE, FAO, other donors, organizations and neighbor countries
- ❑ **Fifth period: 2013 (A), 2014 (O)**
 - Control movement, disinfection, eradication and control, and vaccination, stamping out, public awareness, collaboration OIE, FAO, other donors, organizations and neighbor countries

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Current situation of FMD outbreak (2014)

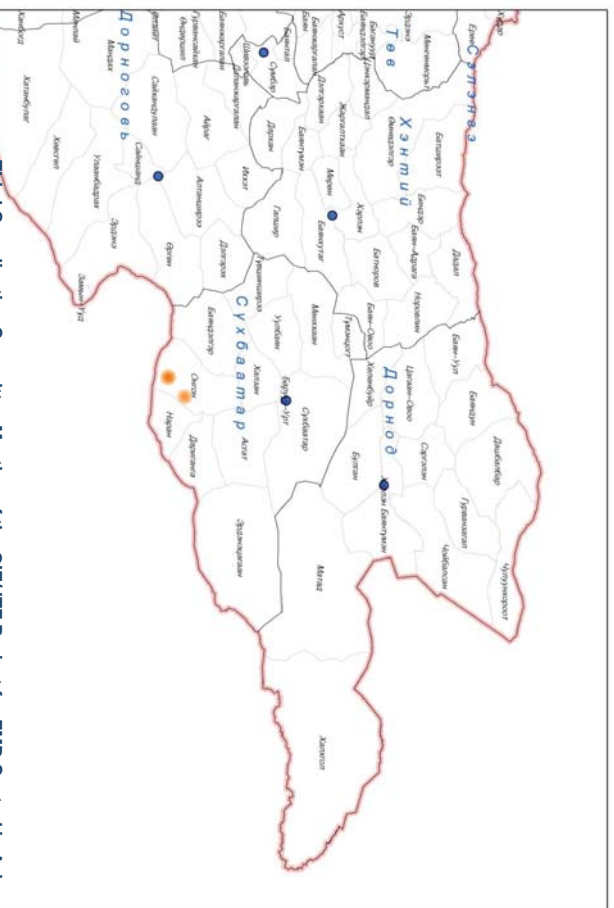
- The 1st case in Ongon soum, Sukhbaatar province on 28 Jan, 2014
- Second case in Naran soum, Sukhbaatar province on 4 Feb, 2014
- Bayandelger soum, Sukhbaatar province on 5 Feb, 2014 ...

(quarantine, all movement control, stamping out, disinfection, emergency vaccination, surveillance, public awareness, collaboration)

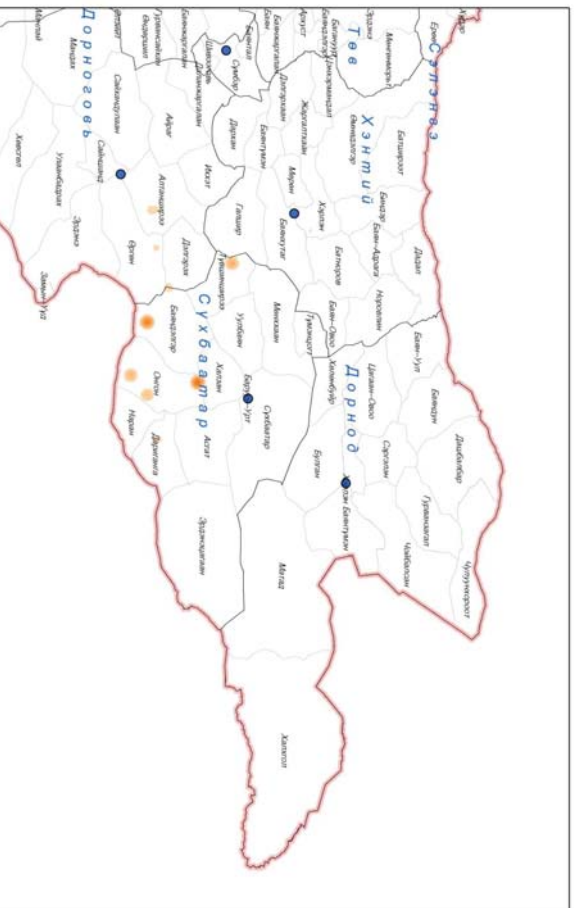
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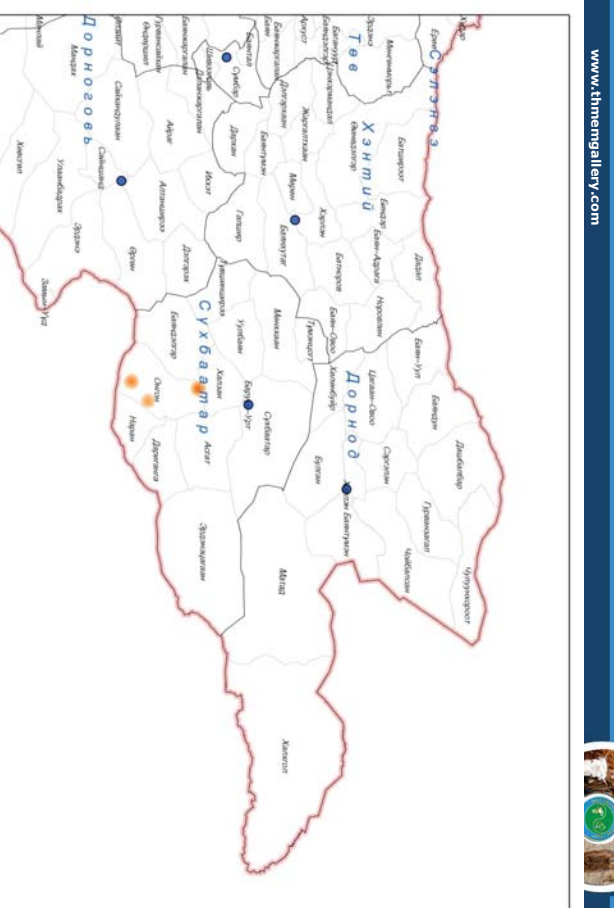
FMD outbreak 26 January 2014



The 9th of February 2014



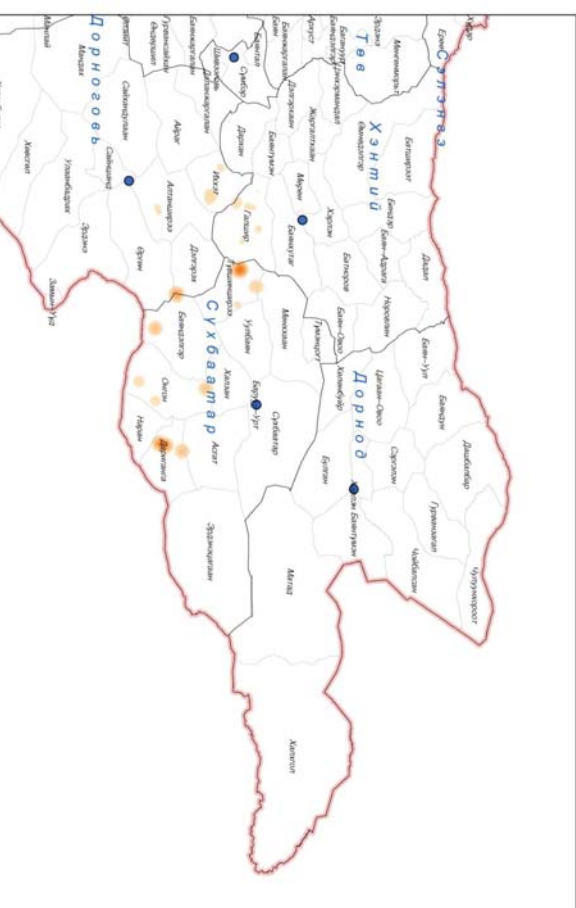
The 2nd of February 2014



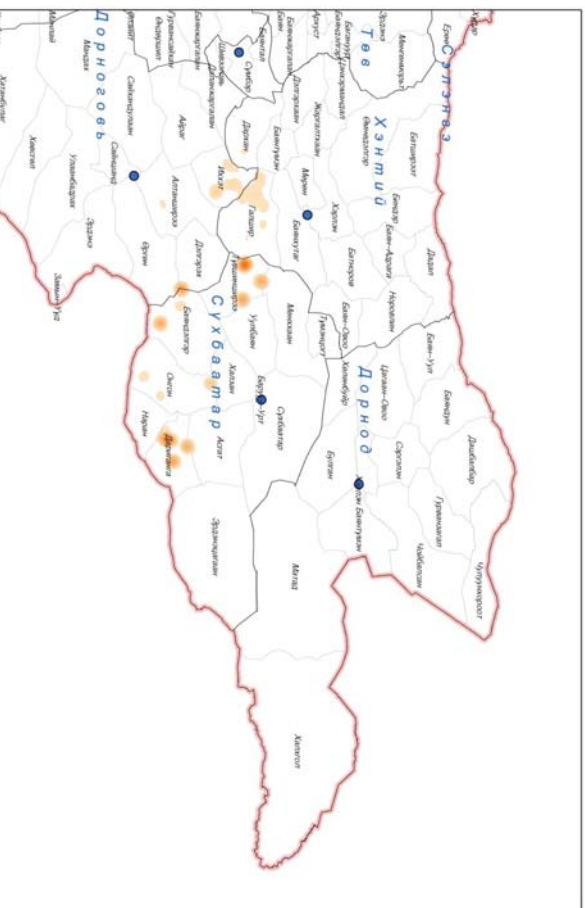
www.timegallery.com



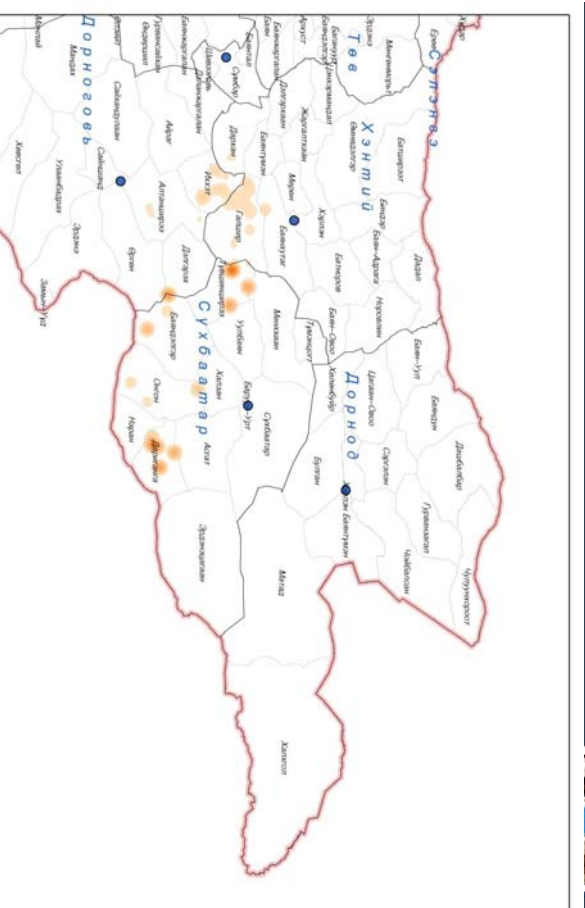
The 16th of February 2014



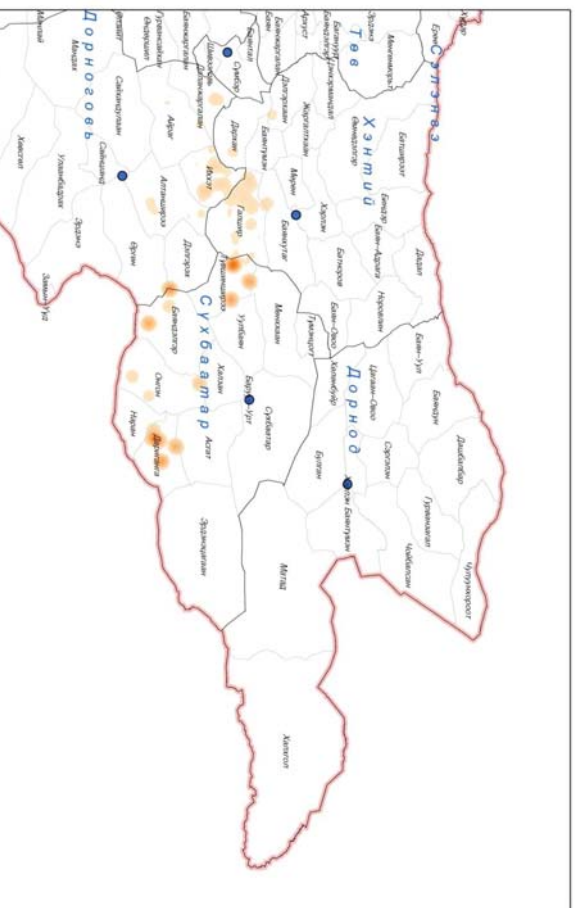
The 23rd of February 2014



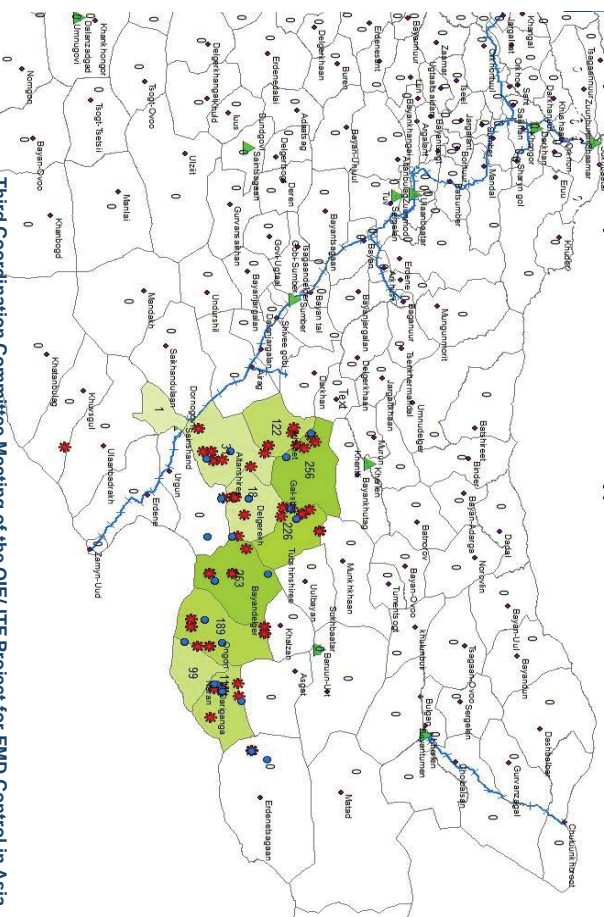
The 2nd of March 2014



The 25th of March 2014

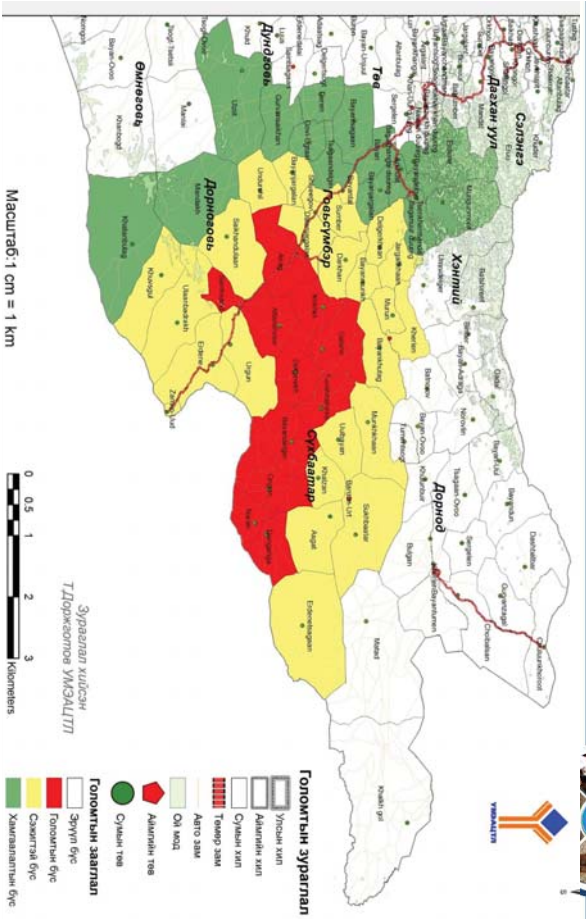


FMD outbreak foci



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Zoning management



Implemented measures in zones

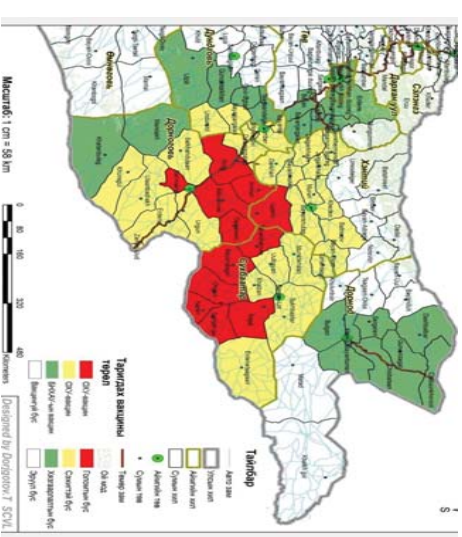
Outbreak zone (Red zone)

- Quarantine
 - Disinfection
 - Modified stamping out
 - Vaccination
 - Compensation
 - Surveillance
 - Cooperation
 - Public awareness
- Buffer zone (Yellow zone)**
 - Quarantine and movement restriction
 - Disinfection
 - Vaccination
 - Cooperation
 - Surveillance (NSP)
 - Protection zone (Green zone)**
 - Movement control
 - Disinfection
 - Cooperation
 - Public awareness
 - Vaccine monitoring



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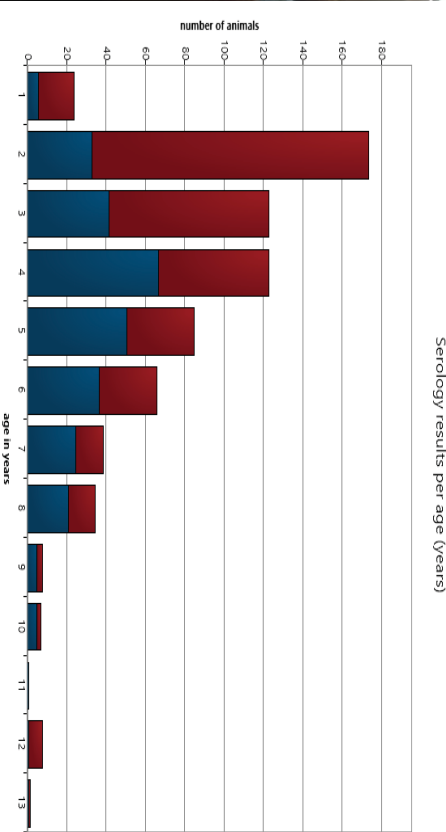
Emergency vaccination



- bivalent (A and O), Shelkovskii, Vladimir, Russia
- trivalent vaccine (A, O, Asia-1), Khukh Khot, China
- trivalent vaccine (A, O, Asia-1), Merial from OIE

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Immunization by age



Company Logo

Control and eradication measures



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Control and eradication measures



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Collaboration



❖ National

- National emergency agency,
- General agency for specialized inspection
- Policy
- Human health sector
- Provincial and primary level organizations

❖ International

- FAO-CMC, OIE
- OIE- RR

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Major constraints



- ❖ Vertical chain command of Veterinary service
- ❖ Insufficient coordination
- ❖ Early detection and early notification- due to information lack (mobile and internet network)
- ❖ Weather condition (2014)
- ❖ Vaccine availability
- ❖ Control of wild animal movement
- ❖ Vaccine- protection??

Third Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia

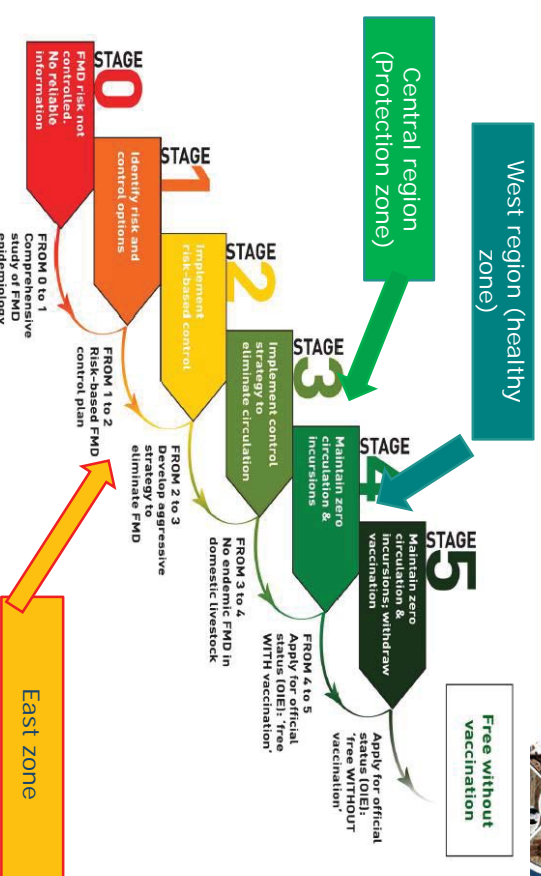
Suggestion to control FMD



- ❖ Vertical chain command of CVO
- ❖ Strengthening veterinary service
- ❖ Strengthening quarantine measures
- ❖ Improve FMD surveillance and monitoring system
- ❖ Information sharing network (national and international)

Third Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia

PCP level of Mongolia



Third Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia

Thank you for your attention

b.batsukh@divab.gov.mn

OTVA - NEVIT



OIE/JTF Meeting on FMD Control in Asia

FAO's Work on FMD in China, Mongolia and DPRK

Professor John Edwards

邓华炯 教授

Senior Technical Coordinator

高级技术协调员

FAO ECTAD CHINA

联合国粮食及农业组织

跨界动物疫病应急中心中国办公室



FAO ECTAD Work in China, Mongolia and DPR Korea



- Working with governments and related organisations to assist with prevention and control of EIDs and TADS
- Epidemiology training including FETPV and new initiatives
- Influenzas including H5N1, H7N9, H5N2, and the next one
- Application of One Health Approaches
- Animal diseases including FMD and African Swine Fever and FMD
- Facilitating collaboration with neighbouring countries



Outline of Presentation

- FAO and FAO ECTAD in China/Mongolia and DPRK
- Epidemiology capacity development
- MOU, recommendations and action plan
- China-Mongolia-Russia Collaboration on TADS
- China-Vietnam collaboration
- CMC Missions
 - Mongolia
 - DPRK

What is FAO ECTAD doing in China?

- MOU and Action Plan with Ministry of Agriculture 与农业部达成谅解备忘录和行动方案
- Epidemiology capacity building (China FETPV) 流行病学能力建设
- One Health Approaches 同一个健康理念
- Emphasis on zoonotic diseases, including influenza (H5N1, H7N9 etc) and other emerging infectious diseases
- Priority TADs such as ASF and FMD
- Assisting with International collaborations 促进国际合作
- Partnering with national institutes (VB, Qindao, Harbin, Lanzhou, Beijing), provincial agencies and universities 与本国政府及相关机构，省级单位和大学建立合作伙伴关系

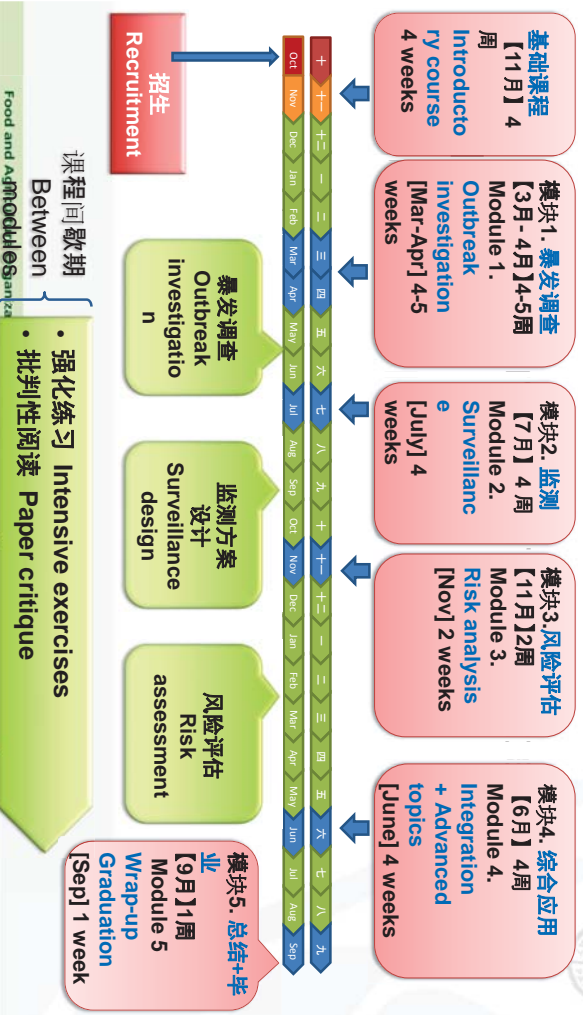


MOU, Recommendations and Action Plan

- MOU signed in May 2013
- Second visit by VB delegation to Rome in May 2014. Updated recommendations and action plan
- Recommendations related to FMD
 - China has now nominated 5 high quality experts who are now available for FAO/OIE CMC missions
 - Facilitate cross border collaborations (see later)
 - Continue joint activity to ensure standards and operating procedures are in place for the reliable transport of laboratory samples, reagents and reference materials to Chinese OIE and FAO reference laboratories
 - Assist with the application of the PCP approach to FMD control in China.

FETPV 培训架构

Training Framework (2-year program)



中国兽医现场流行病学培训项目

China Field Epidemiology Training Program for Veterinarians (China FETPV)

Launched in 2010

Vision

China FETPV seeks to improve animal and public health using scientific and risk based approaches to the control of transboundary animal diseases and emerging infectious diseases.

- Strengthen the knowledge and approaches to applied veterinary epidemiology for China
- Apply interdisciplinary (One Health) approaches in field epidemiology training
- Create a sustainable program for training of veterinary field epidemiologists capable of dealing with complex animal health problems
- Strengthen partnerships among national, provincial and international institutions and foster greater synergy and collaboration
- Nurture trainers and mentors within a national network for training veterinary epidemiologists in China

打造可持续的兽医流行病学人才培养平台——我们从未止步

Building a sustainable capacity development program in veterinary epidemiology for China - We never stop!

2013



2013 3 第一期兽医流行病学高级班
First Veterinary Epidemiology for Executives

2014



2014 1 启动大学名师培养计划——第一期兽医流行病学培训 for University Academics
Launched Veterinary Epidemiology Training for University Academics

2014 6 第一次地区级——西部地区兽医流行病学短期班
First sub-region training and delivered by Chinese trainers

Working with Neighbouring Countries

1. China-Mongolia-Russia Collaboration



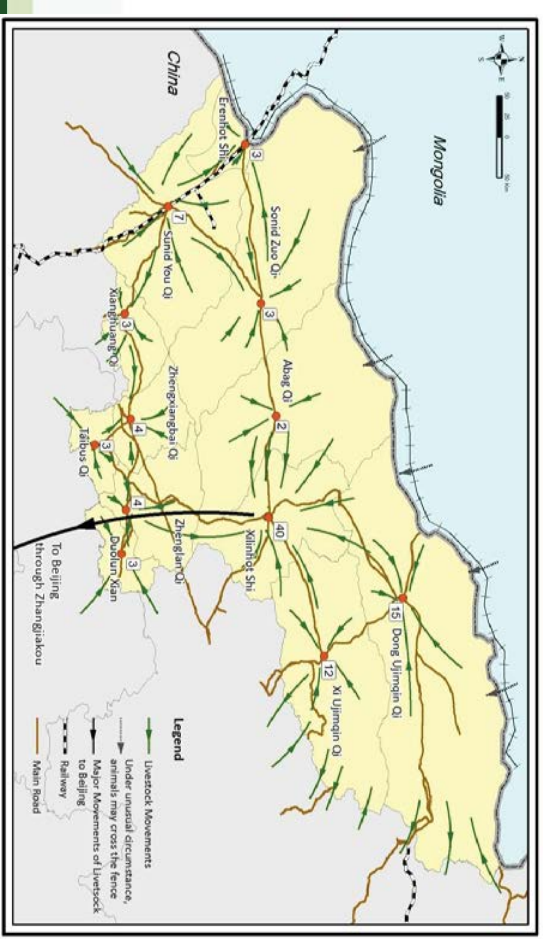
- FMD – International collaboration among China/Mongolia/Russia on TADs with an emphasis on FMD
- Meetings in Beijing, UB and Russia Between 2011-2013
- Erguna, Inner Mongolia, August 2014
- Letter of intent and action plan agreed
- Two joint projects to identify pathways and critical control points for TADs such as FMD



Collaboration on FMD between China/Mongolia and Russia

Surveillance for FMD in Xilinguole Prefecture

中蒙俄口岸防疫合作项目-锡林郭勒盟口岸防疫监测



Status of FMD in the 3 Countries

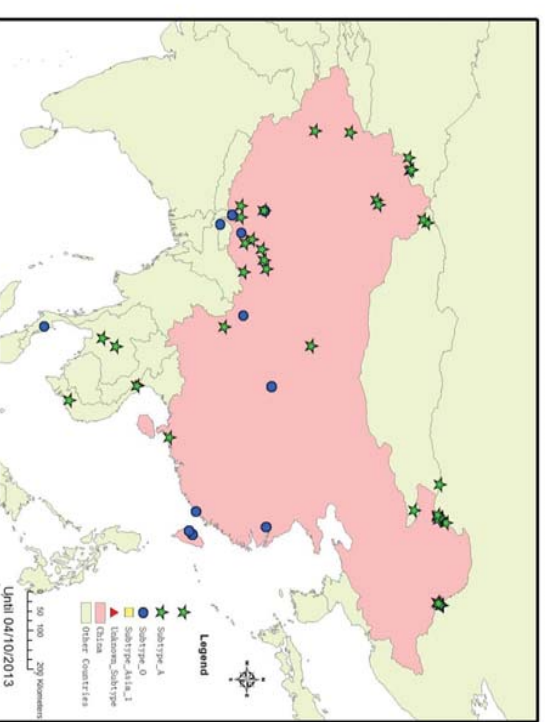
- Ruminants, mainly cattle
- Pigs (some cases in Russia, CSF in Mongolia)
- Gazelles – evidence of disease but expert opinion is that in Mongolia do not play a significant role in persistence of the virus
- FMD in Mongolia – new cases every one to two years for last decade. Always a different strain of FMD and previous strains do not persist. Are neighbouring areas similar?



Status of FMD in the three countries

中蒙俄三国口蹄疫情况

FMD Outbreaks in China and Neighboring Countries in 2013



Status of FMD (Continued)

Most recent types of FMD in the area

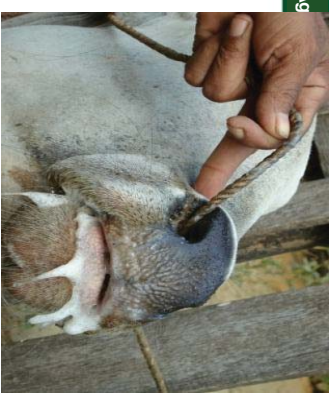
- Type O - Pan-Asia toptotype – closest strain Vietnam (2011)
 - Myanmar 98 – was dominant but now in decline
- Type A – closest related strains in Southeast Asia
 - Two separate variations detected
 - Variation in matching with vaccines (changed vaccine strains)
 - Initially limited coverage of type A vaccines
- Pathways to Russia and Mongolia through east Asia (including China). In the past through central Asia (eg. Type Asia 1)
- Currently vaccines used are trivalent O, A and Asia 1



Summary of FMD Status

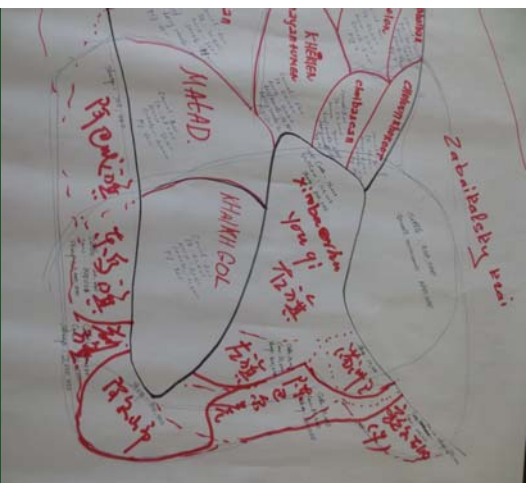
口蹄疫情况总结

- Repeated incursions that do not persist
- Need for early detection, constant monitoring of vaccine matching and sharing of information
- Can we predict the next type and its vaccine matching characteristics?
 - Prepare vaccine supply chains in advance
 - Target prevention and early detection strategies
- Need to understand the pathways for introduction to help manage the risk. Pathways can be local or long distance

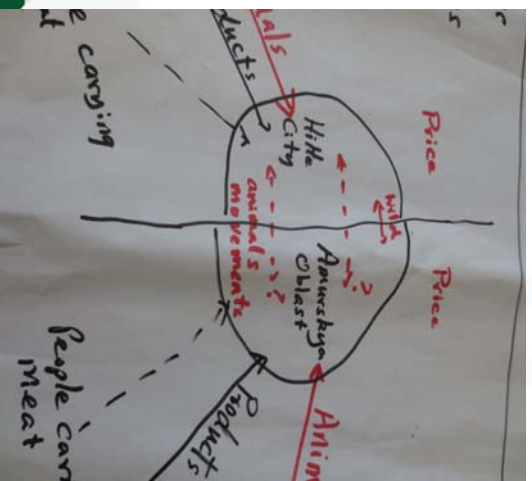


Designing Two Epidemiological Projects

C/M/R 中蒙俄



C/R 中俄



Recommendations 建议

- **Note the status of FMD** in the tripartite collaboration area and the urgency of joint work to predict, prevent, detect and respond to FMD
- **Recommend consideration of two joint project proposals and to agree to implement** subject to availability of resources
- **Develop a process for:**
 - standards for conduct of surveillance for FMD in the three countries
 - sharing of information in real time
- **Final design, oversight and implementation of the two projects**



Working with Neighbouring Countries

2. China Vietnam Collaboration

China Vietnam initiative to collaborate on TADs

- Meetings in Beijing and Halong Bay (VN)
- Next meeting in Guangxi Province
- Ecozone approach vs traditional border approaches
- Risks from different diseases vary eg Influenzas vs FMD
- Both sides strong commitment
- China exploring new approaches to managing movements of livestock

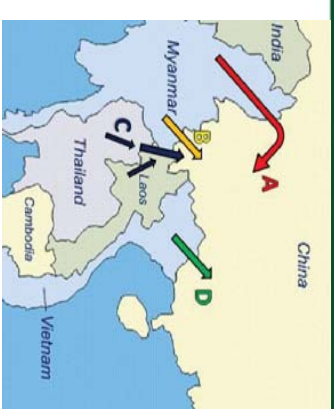


Food and Agriculture Organization of the United Nations

China Vietnam Collaboration (Cont.) 中越合作

- Three joint projects proposed

1. Create buffer zone for assembly and slaughter of livestock from Myanmar, Lao and Vietnam ie, transport meat not animals



Cattle and Buffalo movement (Yunnan and Guangxi)



Food and Agriculture Organization of the United Nations

China Vietnam Collaboration (Cont.) 中越合作

2. Countries work together to facilitate safe trade in day old chicks
 3. Real time communication on risks from TADs and emerging infectious diseases
- Safe pathways for trade of spent hens and other poultry not possible.
- Best option would be to facilitate slaughter in northern parts of China and transport meat.



United Nations



Crisis Management Centre Missions on FMD

- Mongolia (2010, 2014)
- DPRK (early 2014)
- TCP to be launched in October 2014



Food and Agriculture Organization of the United Nations

Key issues from CMC Missions



- Strategy will vary according to:
 - objectives
 - production system,
 - Environment
 - OIE guidelines
- **Efficient and rapid transfer of samples to reference labs - SOPs**
- Supply chains for matching vaccines needed
- Recommendation to modified stamping out policy
- Risks of transmission by control, vaccination, disinfection teams
- Need for regional approaches

Any Questions/Comments? 欢迎提问交流



OIE RRL-Lanzhou

Activities, Research and Lab network

Dr. Hong YIN

OIE FMD Reference Laboratory,
Lanzhou Veterinary Research Institute, CAAS;



Outline

- **Re-organizing in the laboratory**
- **FMD outbreak confirmation and strains analysis**
- **Laboratory activities and network**
- **Active surveillance**
- **FMD research progress in LVRI**

Outline

- **Re-organizing in the laboratory**
- **FMD outbreak confirmation and strains analysis**
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- **Active surveillance**
- **FMD research progress in LVRI**

The Agricultural Science and Technology Innovation Program (ASTIP), 2013 , financially supported by central government
Each year 5 million YUAN (RMB)

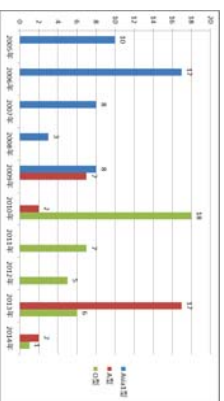
- **FMD Etiology and Epidemiology Team**
- **FMDV Biology Team**
- **FMD Prevention and Control Team**
- **FMD Diagnostic Reagent Producing Center**

FMD Etiology and Epidemiology Team

- Outbreak confirmation of FMD
- FMD surveillance and epidemiology;
- Identification and characterization of FMDV;
- Etiology variations, phylogenetic analysis and molecular evolution;



Chief scientist
Dr. Liu Xiangtao



FMD outbreaks and types in China

FMD Prevention and Control Team

- Study on conventional vaccine;
- Novel FMD molecular vaccines;
- Key techniques for vaccine production
- Penside diagnosis kits
- High throughput diagnostic tools



Chief scientist
Dr. Zhang Yongguang

FMDV Biology Team

- FMDV characterization
- FMDV pathogenesis,
- FMDV ecology,
- FMDV immune mechanism;
- FMDV reverse genetics
- FMDV genomics, transcriptomics and proteomics



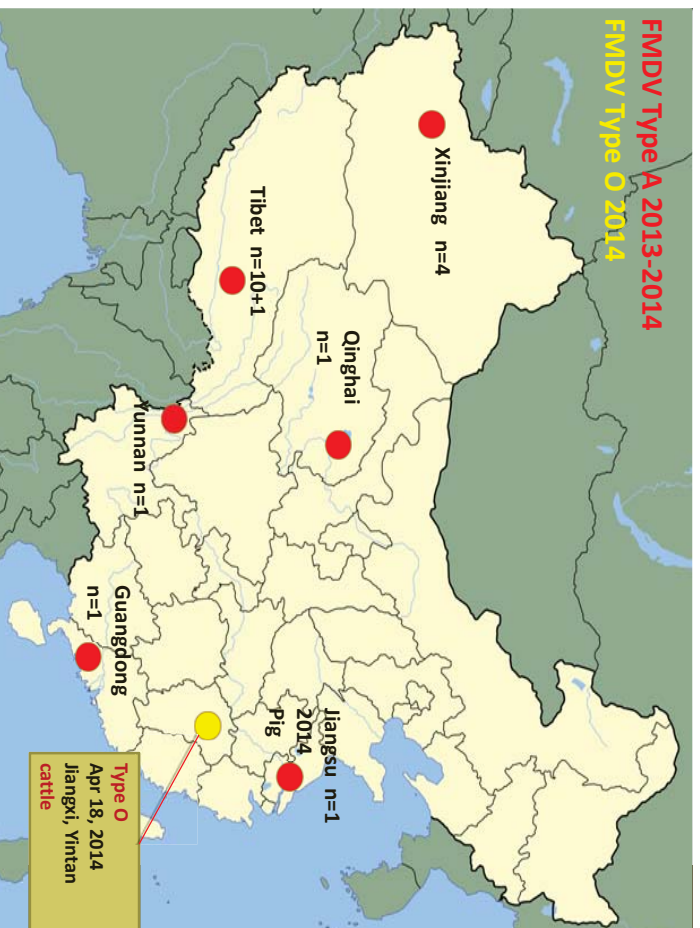
Chief scientist
Dr. Liu axin

FMD Diagnostic Reagent Producing Center

- **Chief scientist** Dr Lin Mi
- Producing the FMD diagnostic kits
- Improving the producing technique
- Commercializing the kit

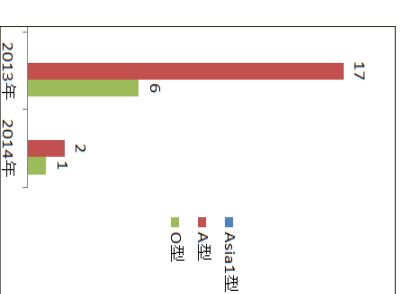
Outline

- Re-organizing in the laboratory
- **FMD outbreak confirmation and strains analysis**
- Laboratory activities and network
- Active surveillance
- FMD research progress in LVRI



1. Summary of FMD situation in China during 2013-2014

- 2 serotype:**
A and O
- 3 Strains:**
A/Sea-97;
O/Mya-98;
O/PanAsia
- No. of outbreaks:**
2013: n=23 (A17+O6)
2014: n=3 (A2+O1)
- Animals affected:**
Cattle; Pig
- Provinces occurred:**
A: 6 provinces
O/Mya-98: 3
O/PanAsia: 1

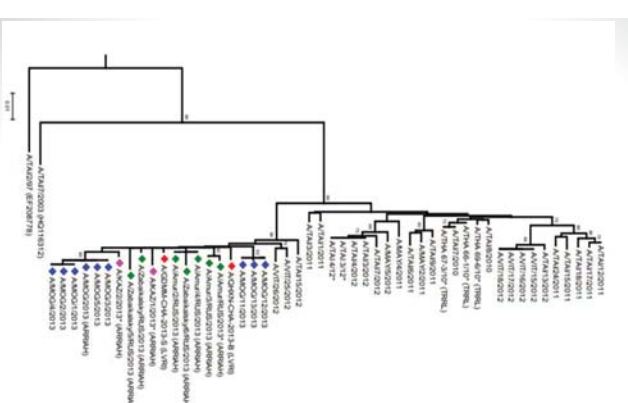


Effective control
Trending downwards

MOLECULAR EPIDEMIOLOGY ANALYSIS

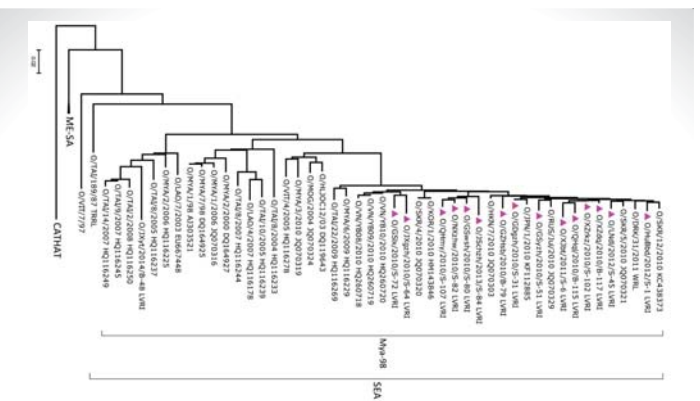
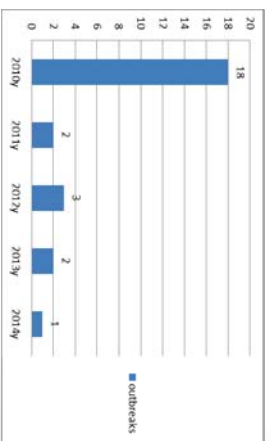
A/Sea-97 strain

- located on the other genetic branch(named G2)
- low genetic relationship with the virus(named G1) found in China in 2009; about 91% identity
- new virus found in China again
- Shared close relationship with viruses from SEA nations past two years: over 98% homology
- also very close relationship with the sequences from RUS, KAZ, MOG



Analysis on O/Mya-98 strains

- Firstly found in 2010 in China;
- Came from SEA nations ;
- One of predominant strains in China;
- Total 26 cases reported;
- Also found in East Asia;
- Outbreaks are on the decline;
- Vaccines used in China are effective for the strains.



Outline

- Re-organizing in the laboratory
- FMD outbreak confirmation and strains analysis
- **Laboratory activities and network**
- **Active surveillance**
- **FMD research progress in LVRI**

Network and training

Diagnosis technology
prevention and control technology
Vaccination technique



Theory teaching
Laboratory skill training

Provincial laboratory
Breeding enterprise technical staff
Visitors

~15 special training courses
~300 people attended



Diagnosis and Reagents provided in 2014, Jan-Jul

- ✓ 31 suspected samples detected, 5 from North Korea
- ✓ ~3000 O/P fluid and tissue samples were tested by RT-PCR for routine survey and emergency.
- ✓ ~20 Vp1 sequences for field strain or isolates.
- ✓ ~8,000 serum tested by LPBE and 3ABC ELISA for SP and NSP antibody

Type of reagent	Related diagnostic test	Amount supplied nationally
Guinea pig antisera (against FMDV type O, Asia1 and A)	VNT	20ml
FMD NSP positive serum	ELISA	1274ml
FMD NSP negative serum	ELISA	31ml
FMD LBP-ELISA kit (Type O, A, Asia1)	ELISA for FMDV Antibody detection	6024 kits
FMDV 3ABC-ELISA kit	ELISA for FMDV NSP antibody detection	1016kits
HA (Type O)	HA for FMDV Antibody detection	5226 kits
FMD antibody Colloid-gold test strips	pen-side test for FMDV Antibody detection	27 kits
FMDV multiple RT-PCR kits	RT-PCR for FMDV molecular detection	151 kits

Network and training

Diagnosis technology
prevention and control technology
Vaccination technique



Theory teaching
Laboratory skill training

Provincial laboratory
Breeding enterprise technical staff
Visitors

~15 special training courses
~300 people attended



In east Asia countries

- Samples from DPR Korea
- Training of colleagues from Mongolia, financially supported by IAEA
- Visiting of colleagues from RO Korea
- Providing diagnostic reagents to DPR Korea

Active surveillance work plan in 2014

- 1) FMD surveillance on pig slaughterhouses in 12 provinces in China
- 2) FMD surveillance around Jiadong peninsula and neighbour provinces in China
- 3) Type Asia1 FMD immune policy evaluation monitoring
- 4) Monitoring in high-risk areas (Guangxi, Yunnan)
- 5) Surveillance on FMD free zone with vaccination in China

Laboratory testing is in progress.....

Outline

- Re-organizing in the laboratory
- FMD outbreak confirmation and strains analysis
- Laboratory activities and network
- **Active surveillance**
- FMD research progress in LVRI

Outline

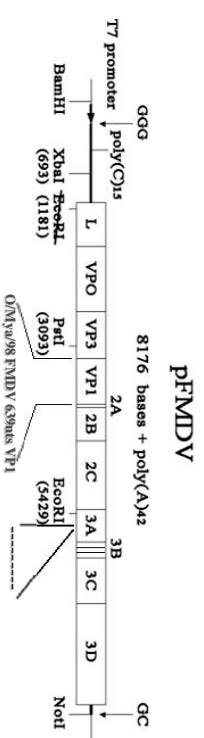
- Re-organizing in the laboratory
- FMD outbreak confirmation and strains analysis
- Laboratory activities and network
- Active surveillance
- **FMD research progress in LVRI**

Vaccine development and registration

- Type O-A-Asia1 trivalent vaccine
- Synthetic Peptide Vaccine (Type O, pigs only)



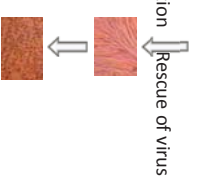
Recombinant virus marker vaccine (serotype O,A,Asia1)



- Deletion can differ vaccinated and infected animals
- 3A deletion in native virus

Table 1: Neutralizing antibody titer and PD₅₀ after immunization with serotype O Marker vaccine

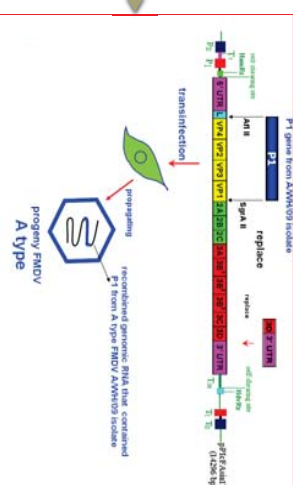
Vaccine	Dose	Number	EPBE-ELISA titer	Protection PD ₅₀
ISAZ01	total (2mL)	5	180,360, >512,256, >512	5/5
	1/3 (0.67mL)	5	>512,360, 360, 180, >512	5/5
Marker vaccine	total (2mL)	5	180, 180, 360, 360, 360	5/5
	1/3 (0.67mL)	5	360, 180, 360, 30, 45	5/5
206c-CLP vaccine	total (2mL)	5	45, 45, 256, 360, 180	5/5
	1/3 (0.67mL)	5	360, 180, 360, 30, 45	5/5
Control	total (2mL)	5	45, 180, 180, 180, 360	5/5
	1/3 (0.22mL)	5	45, 180, 180, 180, 360	5/5



Dr. Zheng haixue
zhenhaixue@caas.cn
Dr. Liu zaixin
liuzaixin@caas.cn

- New vaccine for type A

Re-A WH/09

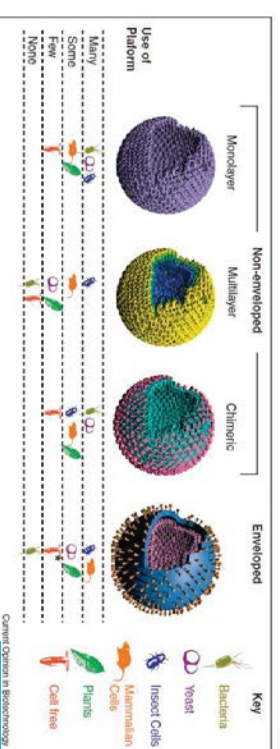


Gene modify vaccine based reverse genetics system

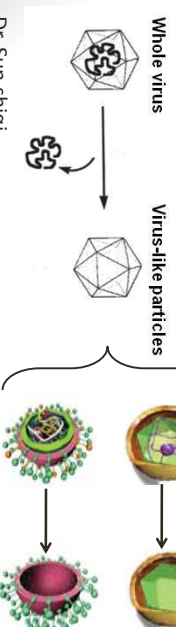
FMD type A Vaccine potency challenged with A/GDMM/2013 strain
PGP test:

Animal test (protection Rate)	AF72	Re-A WH/09	A/GDMM/13
	13/16 (>75%)	15/16 (>75%)	14/16 (>75%)

Virus-like particles vaccine (serotype Asia1,O)



Production platforms used for different VP configurations (VLP produced using virocytes)



Dr. Sun shiqi
sunshiqi@caas.cn

Vaccination with a

Food and non-food source virus-like particles produced by SMDM (SMDM protein system) are required to generate VLP, virus and cells.

China Center for Biotechnology

China Center for Biotechnology

Peptide vaccine (serotype A, Asia 1)

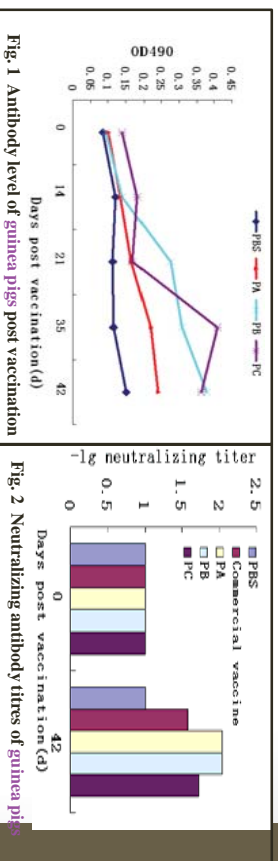
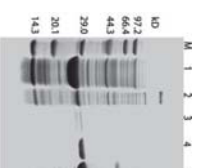


Table1: Evaluation of clinical signs of EVD in guinea pigs challenged with EMDV A/HB/W/H09

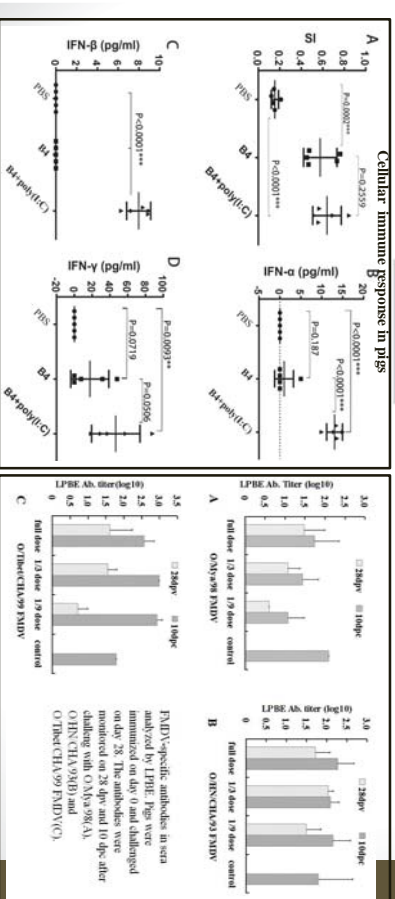
Group	Vaccine	Primary vesicles	Secondary vesicles	Protection rate (%)
1	PBS	6/6	6/6	0
2	Commercial vaccine	5/6	0/6	100
3	PA	6/6	2/6	67
4	PB	5/6	0/6	100
5	PC	5/6	2/6	67

Multi-epitope vaccine (Serotype O)

Epitope protein vaccine contains neutralization epitope and general T cell epitope from three serotype O topological virus



Dr. Chang huiyun
changhuiyun@caas.cn



Thank you for your attention





SEACFMD ACTIVITIES – FOCUS ON 2012-2014

EXPANDED 3RD COORDINATION COMMITTEE MEETING OF OIE/ITF PROJECT ON FMD

CONTROL IN ASIA
LANZHOU, P.R. CHINA
SEPTEMBER 24, 2014

Dr. Karan Kulrajia

Project Officer
OIE Sub-Regional Representation for South-East Asia
Bangkok, Thailand



WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future



The SEACFMD Campaign

Background

- Formally established in 1997 by 7 founding members (Cambodia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand and Vietnam)
- Indonesia (FMD free country) became a member in 2000
- China, Singapore, and Brunei joined in 2010
- 4 Phases:
 - Phase 1 from **1997-2001**; Phase 2 from **2001-2005**; Phase 3 from **2006-2010**; Phase 4 from **2011-2015**



2

SEACFMD

Objective

To coordinate animal disease control activities between countries, provide technical advice, ensure coherent strategies, and seek political and financial support to achieve FMD Freedom in the Region in year 2020.

SEACFMD approach serves as a model for regional coordination, not only for FMD, but for a range of other transboundary and zoonotic diseases.



3

SEACFMD

FMD Global Strategy :

1. Improve global FMD control
2. Strengthening veterinary services
3. Improve the prevention and control of other major diseases of livestock.

SEACFMD 2020 Roadmap*:

1. Combat FMD at source
2. Establish and subsequently expand FMD control zones
3. Protect zones that are currently FMD free



4

Roadmap Technical Principles

- Rapid identification of the foci of infection
 - Surveillance
- Elimination of the source of FMDV
 - disinfection
- Prevention of infection of susceptible hosts
 - restrict infected from contact w/healthy herd
- Increasing herd and animal immunity
 - vaccination



5

STREAMLINING COORDINATION AND ADVOCACY



1 REFINING TECHNICAL ACTIVITIES

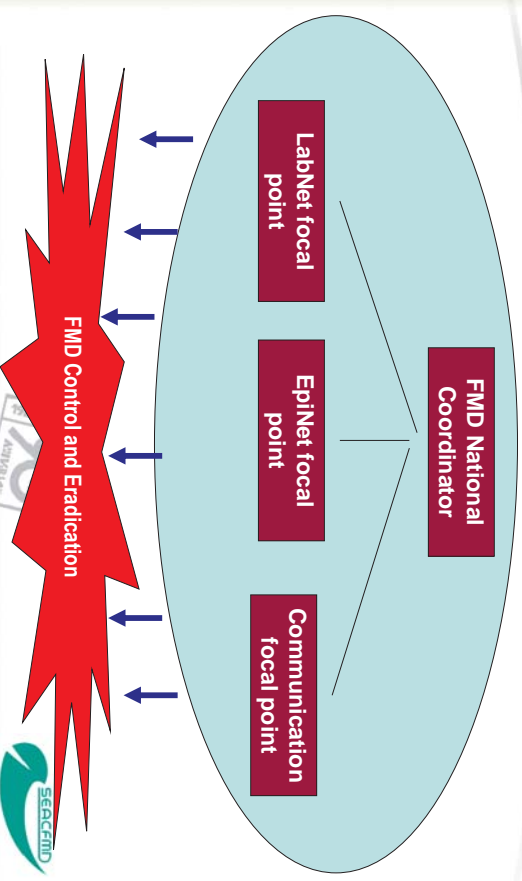
- The fundamental principle to prevent, control and eradicate FMD is to **break the transmission cycle of the virus.**



Bangkok, Thailand, 10-12 July 2018



National Coordination



8

GOVERNANCE AND POLICY



- Strengthening governance at different levels (international, regional, national)
- Building on existing institutions and their strengths
- Public and Private Partnership
- Monitoring and Evaluation



9

CROSS-CUTTING Strategies

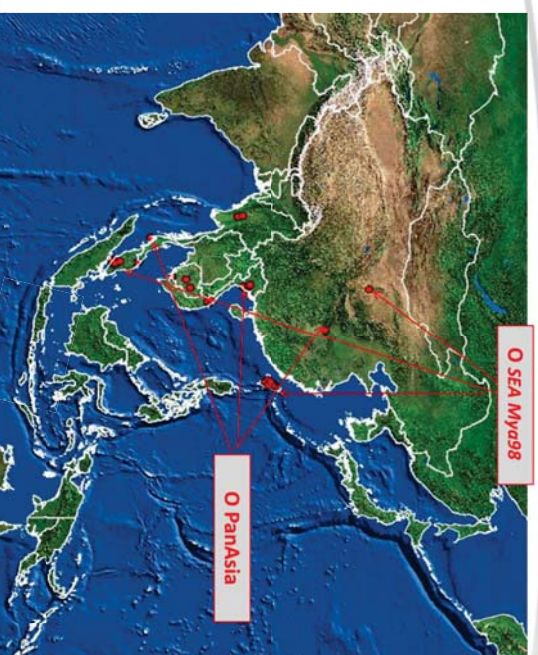


- Communication strategies at different levels
- Capability building
- Research and Development



10

Analysis of Disease data



11

Pilot vaccination Lao PDR/Myanmar/Cambodia



12

Vaccine Delivery



Date	Country	No. doses	Type of vaccines
11/05/2012	Lao PDR	200,000	O1 Manisa + O-3039, A Malaysia 97, Asia 1 Shamir
13/06/2012	Myanmar	200,000	O1 Manisa + O-3039, Asia 1 Shamir
27/01/2013	Myanmar	300,000	O1 Manisa + O-3039, Asia 1 Shamir
19/02/2013	Cambodia	100,000	O1 Manisa + O-3039, A Malaysia 97, Asia 1 Shamir
27/03/2013	Lao PDR	600,000	O1 Manisa + O-3039, A Malaysia 97
TOTAL DOSES DELIVERED		1,400,000	



HPED



13

Revisions of National FMD Plans



15

SGF support to vaccination



STANDZ/SGF/2013/01/CAM: "Targeted FMD Vaccination campaign in Takeo province, Cambodia"

STANDZ/SGF/2012-02/LAO: "Targeted FMD Vaccination in hotspots in Northern Lao PDR"

STANDZ/SGF/2013/03: "Targeted FMD Vaccination Campaign in Northern Lao PDR"

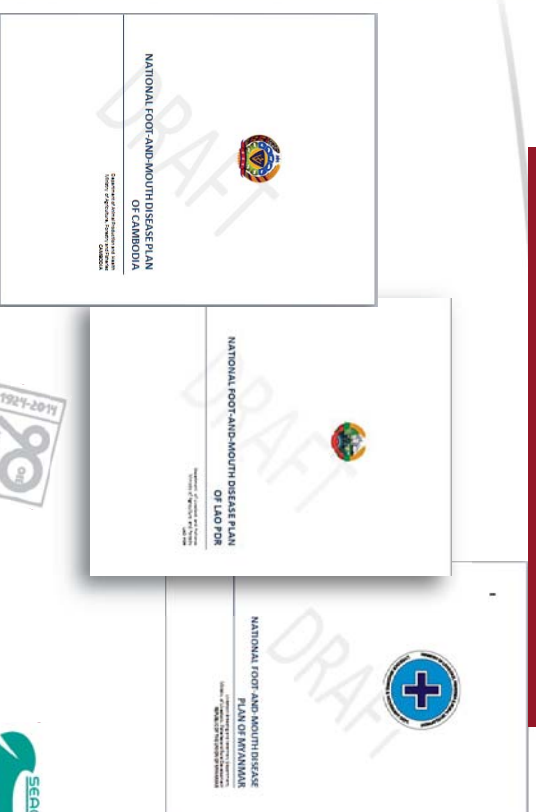
STANDZ/SGF/2012-03/MYA: "Targeted FMD Vaccination Campaign in Sagaing And Dawei Districts and Public Awareness Program in Muse Township"

STANDZ/SGF/2013/04/MYA: "Targeted FMD Vaccination Campaign in Mandalay (Myanmar)"



14

Revisions of National FMD Plans



16

National FMD Plans

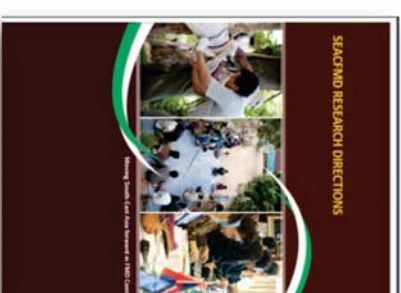


Assist Malaysia prepare for submission to OIE of their National FMD Plan



17

Research Priorities



18

Research conducted/commissioned



Research Title	Utility/Application
"The past, present and future of foot-and-mouth disease in South-East Asia – A review"	The output was used as a background material/reference to the following documents developed by OIE SRR SEA: "SEACFMD Research Directions", "policy engagement Strategy", and "FMD in South-East Asia: Current Situation and Control Strategies"
"The impact of foot-and-mouth disease and benefits associated with eradication in South-East Asia: Identifying gaps for future opportunities"	The output was used as a background material/reference to the following documents developed by OIE SRR SEA: "SEACFMD Research Directions", "policy engagement Strategy", and the on-going socio-economic study contracted by OIE SRR SEA.
"Rapid Assessment of FMD Vaccination in Sagaing, Myanmar"	This study provided invaluable feedback from farmers, such as reasons for farmers' dislike towards vaccination (neck swelling, cattle illness, etc.), among others.
"Animal Movement Study at the India-Myanmar Border"	Having obtained information indicating existing price gradients in the three countries (Myanmar < India < China. The methods and questionnaires used in this study can be utilised in an expanded study to include other cross-border points along the Myanmar-India border.
"Overview of FMD in South-east Asia, 2000-2012"	This study reviewed field and laboratory data of FMD outbreaks in the last 13 years. A number of key observations for circulating FMDV serotypes in the region were made. Invaluable information which are critical for designing interventions.
"Post-Vaccination Monitoring (PVM) in Targeted Vaccination Areas in Mandalay"	This work aims to determine the impact of the vaccination campaign in Myanmar. This study is a pilot trial for the vaccination monitoring approach/methodology developed by OIE SRR SEA.



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Northern Lao PDR FMD project



- Strategic mass vaccination in priority districts from 2014 -2015
- 26 priority districts in 10 provinces
- Risk-based approach
- Epidemiological studies
- Animal movement control
- Funded by Australia under STANDZ



20

Launching of the Northern Lao PDR FMD Project



21

Socio-economic study

- Macro-economic study
- Micro-economic
 - A workshop on a harmonised methodology for economic assessment of FMD impact at the village level conducted June 2013, Bangkok
 - Scope - Cambodia, Lao PDR and Myanmar
 - 12 villages with previous history of FMD outbreaks
 - Estimate the village impact of FMD outbreaks
 - Estimate household impact



23

Supported FMD Outbreak Investigations

- Cambodia
- Myanmar
- Vietnam



22

Proposed Animal Movement Study in 2014

- To provide SEACFMD with the latest information/analysis of the cross border movement of FMD susceptible animals
- Use this information to develop strategic interventions to mitigate FMD spread
 - Recommend policy changes for member countries
 - Inputs for development of specific projects to control FMD along the border
- Overview of animal movement trends in China, Lao, Myanmar, Thailand and Vietnam
- Higher resolution understanding on the mechanics of cross border movement
- Map out critical points for cross-border movement
- Identify KEY stakeholders in cross border movement
- Recommend measures to reduce risk of FMD and other TADS spread across the border



24

National Coordinators meeting



- Reviewed vaccination coverage
- Analyze animal movement pathways
- Workshop on SEACMD performance



25

SEACFMD EpinNet



26

SEACFMD LabNet



- Support to proficiency testing and other diagnostic activities



27

Upper Mekong WG meeting



- Bokeo, Lao PDR
 - 12-14 Feb , 2014
- Reviewed Upper mekong zoning
- Update animal movement patterns
- Risk-assessment of UMI zone
- Vaccination strategy



28

20th SubCom Meeting



- Review of the roadmap
- Analysis of new serotype A



29

MTM Meeting



Reaffirmed to continue the MTM Campaign



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SEACFMD Newsletter



31

Policy Engagement



MINISTERS OF MYANMAR AND CAMBODIA, VP of MYANMAR

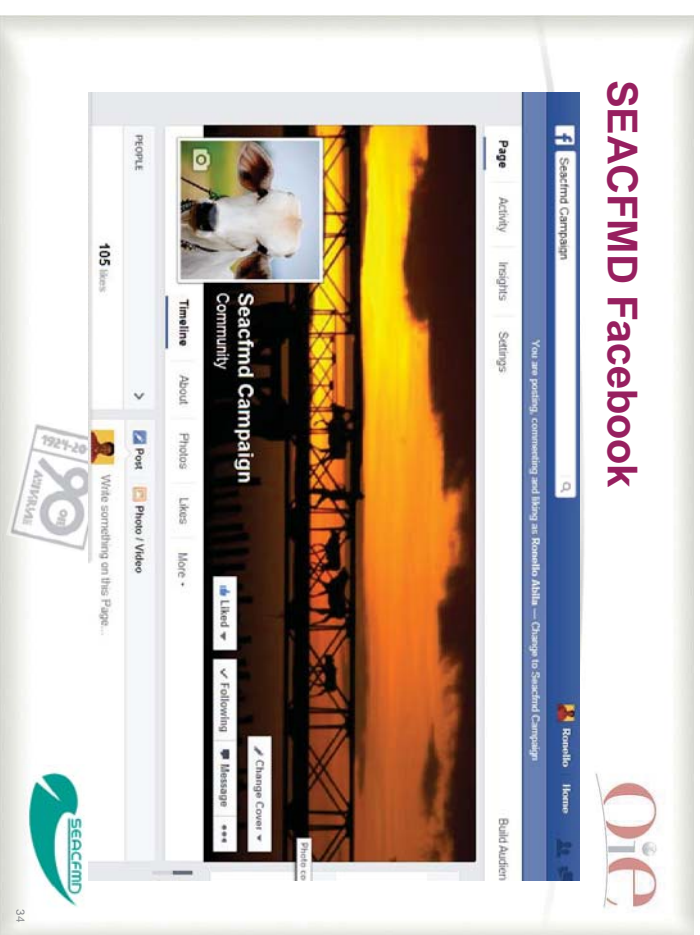


32

Public awareness



SEACFMD Facebook



SEACFMD Facebook



Roadmap Revision



Trainer's of Training in Outbreak Investigation and Management



37

Training in Northern Lao FMD Project

- Outbreak Investigation
- Communication



38

OIM Trainer's Training in the Philippines



39

Donors supporting SEACFMD Campaign



- Small Grant Facility
- SEACFMD Operations



- **HPED**
- FMD Vaccine Bank



Japan TF FMD Project

HPED – EU

RO Korea FMD Project



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Thank you for your attention!



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REGIONAL VACCINE BANKS FOR ASIA

Dr Agnes Poirier

OIE Sub-Regional Representation for South-East Asia



Outline



- > Vaccine Banks: Concepts and Benefits
- > OIE Vaccine Banks
- > Regional Vaccine Banks for Asia: EU-HPED programme
- > FMD Regional Vaccine Bank for Asia
- > Rabies Regional Vaccine Bank for Asia
- > Regional Vaccine Banks for Asia: the way forward and recommendation

2

Vaccine Banks Concept and Benefits



- > Call for tender for a large quantity of vaccines
- > Availability of high quality vaccines complying with international standards
- > Reduction of the purchase cost per vaccine unit
- > Reduction of administrative delays and costs associated with local registration and the purchase of biologicals
- > Rolling stock at the vaccine production company
- > Rapid dispatch of emergency stocks in line with the needs in the field (including small amounts)
- > Public-private partnership

3

OIE Vaccine Banks



- > In 2006, the OIE set up a Regional Vaccine bank for AI in Africa funded by EU (PACE programme) with an agreement with AU/IBAR
- > In 2007, the OIE set up a Global Vaccine bank for AI funded by Canada
- > A total of 62,017 million H5N2 doses were delivered to Mauritania, Senegal, Egypt, Mauritius, Ghana, Togo and Viet Nam (26.7 millions doses)
- > In 2009, EU funded HPED programme started seeing the expansion of the Vaccine Bank to Asia for AI, FMD, Rabies and other TADs => next slides for details
- > In 2012, Bill & Melinda Gates Foundation funded a vaccine bank for PPR in Africa

4

Regional Vaccine Banks for Asia



EU-funded HPED PROGRAMME

- > Regional Cooperation Programme on Highly Pathogenic and Emerging and re-emerging Diseases in Asia (HPED)
- > December 2009 – December 2013 (no-cost extension December 2014)
- > Eligible countries: Afghanistan, Bangladesh, Bhutan, Cambodia, China, India, Indonesia, DPR Korea, Laos, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Viet Nam
- > OIE component:
 - > Activity 1: Regional Vaccine Banks (FMD and Rabies)
 - > Activity 2: PVS Pathway Activities
 - > Activity 3: Capacity Building

5

FMD Regional Vaccine Bank for Asia



- > Vaccine characteristics:
 - > Water in oil in water vaccine (double oil emulsion) for ruminants and swine
 - > Highly purified double inactivated antigens and purified adjuvants – no NSPs
 - > High potency – at least 6PPD50
- > Conservation and vaccination:
 - > Cold chain (+ 2°C to + 8°C)
 - > Gentle mixing and deep intramuscular injection to cervical site (proper restraint)



7

FMD Regional Vaccine Bank for Asia



- > Initial composition of the FMD Regional Antigen/Vaccine Bank (OIE Sub-Commission for SEACFMD, Bali, March 2011):
 - > Five core strains: O1 Manisa; O-3039; A Malaysia 97; A Iran 05; Asia 1 Shamir
 - > Six optional strains: A 22 Iraq; SAT 2 Eritrea; SAT 1; O-4625; A Saudi 95; SAT 3
 - > Pre-formulated vaccine: (O1 Manisa; O-3039; A Malaysia 97; Asia 1 Shamir)
- > Vaccine supplier selected through an international call for tender, contract signed in November 2011



6

FMD Regional Vaccine Bank for Asia



- > Size of vaccine vials:
 - > 50 ml (25 cattle equivalent doses)
 - > 100 ml, 200 ml, 300 ml, 20 ml (pre-formulated vaccine)
- > Production and delivery options:
 - > urgent and immediate (5 working days)
 - > urgent, but not immediate (5 to 15 working days)
 - > rapid (15 working days to 2 months)
 - > planned (over 2 months)



8

FMD Regional Vaccine Bank for Asia



Procedure for requesting vaccines:

- > "Utilisation Guidelines for the OIE Foot and Mouth Disease Regional Vaccine Bank for Asia", endorsed at 18th Meeting of the OIE Sub-Commission for SEACFMD, Lijiang (P.R. China) on 5-9 March 2012
- > Request sent to the Director General of the OIE, via the OIE Sub-Regional Representation in Bangkok or the OIE Regional Representation in Tokyo



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FMD Regional Vaccine Bank for Asia



Date	Country	No. doses	Type of vaccines
11/05/2012	Lao PDR	200,000	O1 Manisa + O-3039, A Malaysia 97, Asia 1 Shamir
13/06/2012	Myanmar	200,000	O1 Manisa + O-3039, Asia 1 Shamir
27/01/2013	Myanmar	300,000	O1 Manisa + O-3039, Asia 1 Shamir
19/02/2013	Cambodia	100,000	O1 Manisa + O-3039, A Malaysia 97, Asia 1 Shamir
27/03/2013	Lao PDR	600,000	O1 Manisa + O-3039, A Malaysia 97
16/12/2013	Myanmar	500,000	O1 Manisa + O-3039
06/03/2014	Mongolia	300,000	O1 Manisa + A Iran 05 + Asia 1 Shamir + A 22 Iraq
30/04/2014	DPR Korea	150,000	O1 Manisa + O-3039
Total Doses Delivered		2,350,000	



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FMD Regional Vaccine Bank for Asia



- > Recent changes in the movement and nature of FMD serotype A in the region
- > Experts Group Meeting reviewed the strains to be maintained in the Regional Vaccine Bank during the 20th meeting of the OIE Sub-Commission for SEACFMD (Nay Pyi Taw, Myanmar, 14 March 2014)
- > A Iraq 22 included in the core strains



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FMD Regional Vaccine Bank for Asia



- > Evaluation of the impact of the FMD Regional Vaccine Bank
- > Recipient countries have to report on the implementation and results of their respective vaccination campaigns
- > Post-vaccination monitoring under SEACFMD campaign



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Rabies Regional Vaccine Bank for Asia



- > Vaccine suppliers selected through international call for tender, contracts signed in March and May 2012
- > Vaccines complying with OIE quality standards
- > Composition of the bank:
 - Parenteral rabies vaccines for dogs and cats in 10ml vials (i.e. 10 doses) – up to 3,000,000 doses (EU funds)
 - Parenteral rabies vaccines for dogs and cats in 1ml vials
 - Oral rabies vaccines for dogs to be used in pilot research projects



13

Rabies Regional Vaccine Bank for Asia



Public Awareness



- > World Rabies Day (28 Sept.)
- > National rabies awareness month (March, Philippines)
- > National Animal Vaccination Day (11 November, Lao PDR)



- > IEC materials: posters, brochures, equipment for vaccination teams, dog collars, video and interviews



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Rabies Regional Vaccine Bank for Asia



Date	Country	Number of doses
26/09/2012	Lao PDR	50,000
12/12/2012	Viet Nam	200,000
20/02/2013	The Philippines	500,000
14 & 17/06/2013	Lao PDR	120,000
20 & 24/06/2013	Sri Lanka	300,400
19/07/2013	Bangladesh	200,000
31/07/2013	Indonesia	200,000
05/09/2013	Bhutan	20,000
20/09/2013	Myanmar	200,000
27/10/2013	Nepal	200,000
16/12/2013	Viet Nam	500,000
29/01/2014	Afghanistan	200,000
21/02/2014	The Philippines	300,000
TOTAL DOSES DELIVERED		2,990,400

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OIE Regional Vaccine Banks for Asia – The way forward



End of the HPED funding (December 2014)

- > EU and other potential donors, including the private sector and foundations, have been approached
- > Contracts with vaccine suppliers to be extended
- > Possible purchase from the Regional Vaccine Bank by countries or international / regional organisations through OIE Headquarters or through additional financial support from other donors (e.g. Australian funded STANDZ programme for Lao PDR, Myanmar and Philippines; forthcoming New Zealand project in Myanmar and Laos)



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Proposed Recommendation



- > To invite potential Donors, including the private sector and foundations, regional economic communities and individual countries to continue funding for the OIE Regional Vaccine Banks after the current EU-funded HPED programme finishes in December 2014

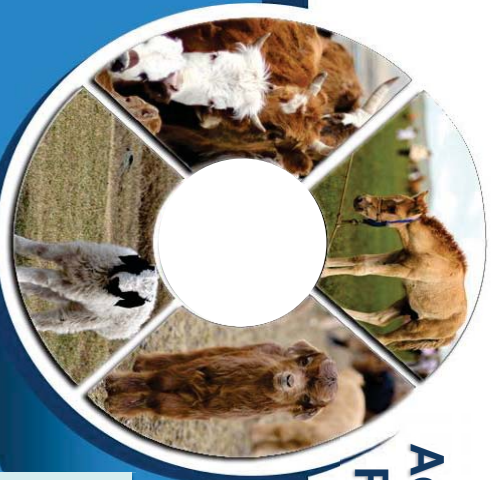


17

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Activities of OIE/JTF Project in Mongolia

www.dvab.gov.mn

BATSUKH Basan

Officer of Trans-boundary animal diseases and
Foreign relations of

Veterinary and animal breeding agency
Implementing Agency of Mongolian
Government

Third Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia

Content



FMD status

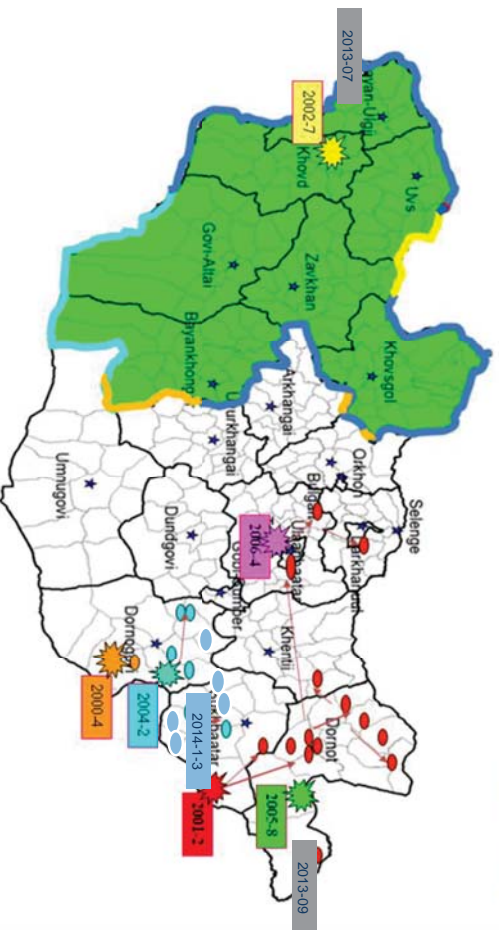
FMD control activities

Challenges and difficulties

Future activities

Third Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia

Overview of FMD outbreaks



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Timing and number of FMD outbreaks of 2000-2014



Year/month	2000	2001	2002	2003	2004	2005	2006	2010	2013	2014
January										1
February										11
March					4					1
April					1	1			1	1
May					1	1				1
June										1
July						3				1
August									1	2
September									11	1
October										2
November										6
December										
TOTAL	2	25	3	0	20	1	1	24	2	13

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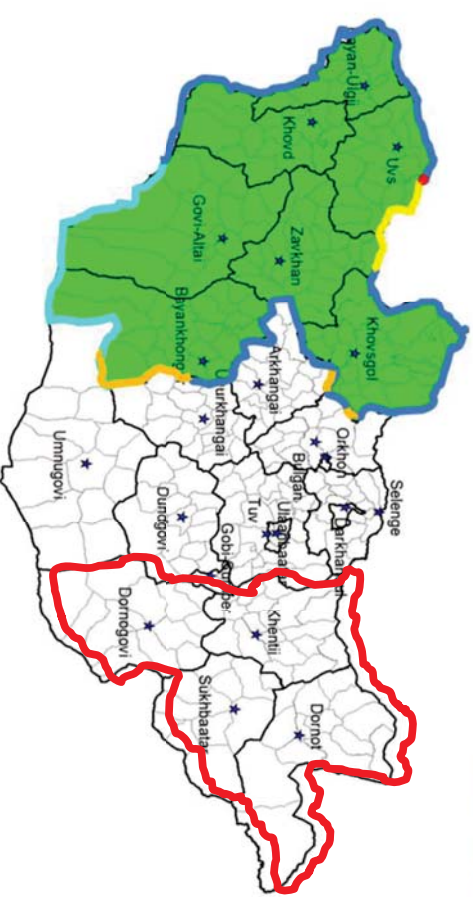
Activities related to FMD



- ❖ **FMD risk assessment**
- ❖ **FDM cost benefit analysis**
- ❖ **Regular vaccination**
- ❖ **Surveillance**
- ❖ **Zoning management- movement control**
- ❖ **Collaboration (neighboring countries, organizations)**
- ❖ **Strengthening veterinary capacity**

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FMD risk assessment



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FMD risk assessment



- ❖ **From the eastern 4 provinces**
 - Each 3 representatives
 - Sukhbaatar, Khentii, Dornod, Dornogobi
- ❖ **From the western 7 provinces**
 - Each representatives
 - Bayan-Ulgii, Khuvsgul, Gobi-Altay, Khovd, Bayanhongor, Uvs, Zavkhan
- ❖ **From vet school**
 - 4 master students
- ❖ **Organizers**
 - VABA, AHP, SAFOSO, WCS
- ❖ **Local vets and herders (181)**

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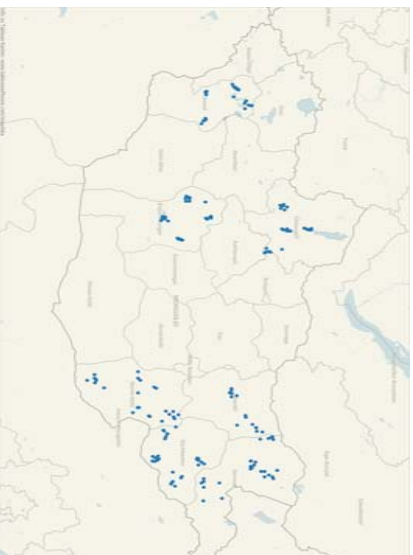
FMD risk assessment



Information collection



- ❖ Survey among the stakeholders
- ❖ Based on own knowledge
- ❖ Focus on risk
- ❖ Participants has done survey themselves



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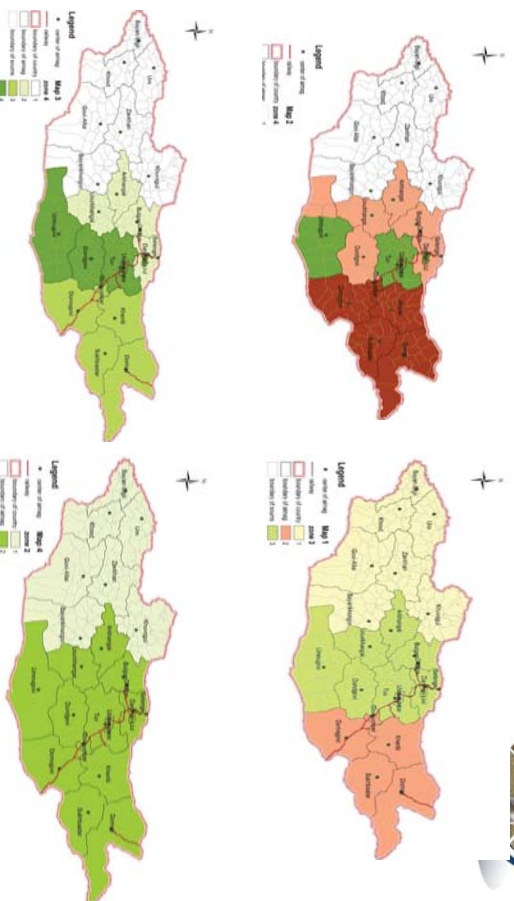
FMD RA conclusion



- ❖ **Introduction FMDV risk is very high in the eastern part of country**
 - Cross border movement -geographic condition
 - Illegal and legal importation of animals
 - Animal fodder, movement of wildlife
- ❖ **Spread of FMDV infection is very high in the western part of the country**
 - Illegal and legal importation of animals
 - Breeding animals
 - People movement

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FDM cost benefit analysis



37th M3YF
Third Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia

FDM cost benefit analysis



- ❖ **Total products= domestic consumption- excess products**



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FDM CBA- Conclusion



❖ West 7 provinces should have status FMD free without vaccination

- Constant supply from the western zone
- Domestic consumption is provided from the eastern part of country
- Transportation cost is high from the west to UB city
- In the eastern part of country it is difficult to control animal movement

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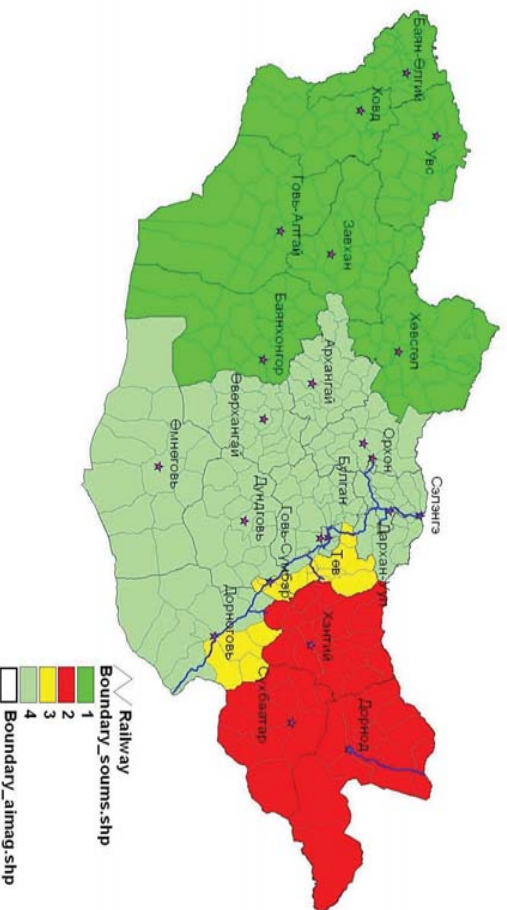
FMD control strategy in Mongolia



- ❖ Animal movement control from east to west;
- ❖ Regular vaccination in risky zone;
- ❖ Surveillance to ensure early detection of the infection in the western zone;
- ❖ Post-vaccination surveillance in vaccinated area (eastern part of country);
- ❖ Developing contingency plan, FMD strategy;
- ❖ Change of instruction of combating FMD outbreak
- ❖ Collaboration

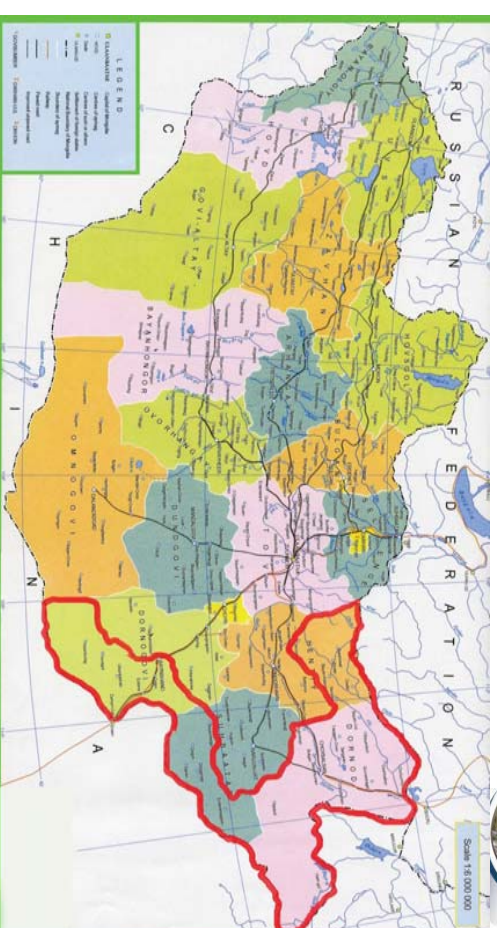
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Regular vaccination since 2010



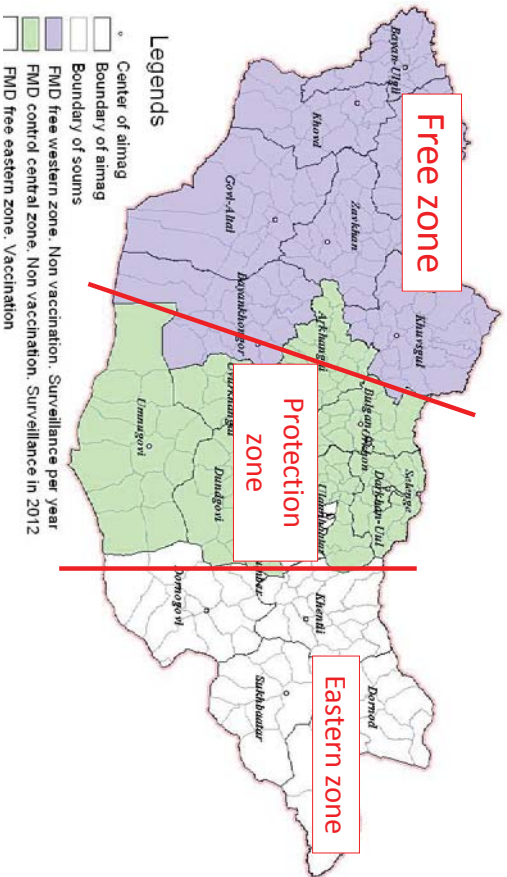
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FMD vaccination in 2015



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Surveillance to detect infection of FMD (2009-2014)



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Surveillance in the western 7 aimag in 2011



No	Zone	Total tested samples	Positive samples	%
1	A	1520	173	11.38
2	B	9055	742	8.19
3	C	7226	231	3.19
4	D	9159	71	0.77
Total		26960	1217	4.5

Third Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia

Result of surveillance

www.timengallery.com

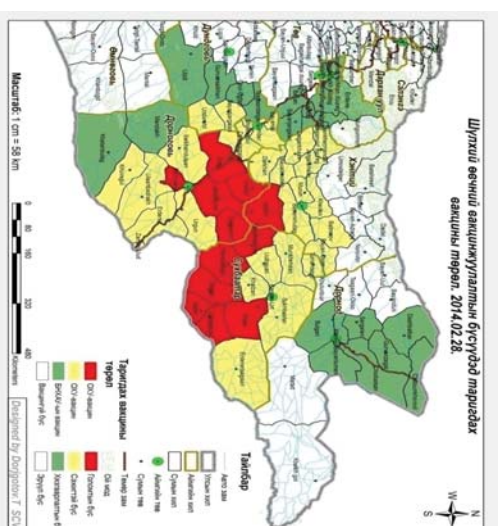
2010 2011 2012 2013 2014



Name of province	Sample	Reactor	Sample	Reactor	Sample	Reactor	Sample	Reactor	To be Reactor	
1 Bayan-Ulgii	654	0	1329	4	1320	0	1422	1058	1730	
Bayankhong	960	0	1380	0	1380	0	1560	7	1560	
2 or	960	0	1380	0	1380	0	1560	7	1560	
3 Gobi-Altai	960	5	1260	0	1213	0	1559	52	1560	
4 Khovd	930	13	1466	2	1320	0	3485	50	1730	
5 Khuvsgul	960	1	962	2	960	6	1500	0	1560	
6 Uvs	960	3	1560	2	1560	0	3070	41	1560	
7 Zavkhan	960	0	1560	1	1536	5	1559	9	1560	
Total	6384	22	9517	11	9289	11	26960	1217	11425	0

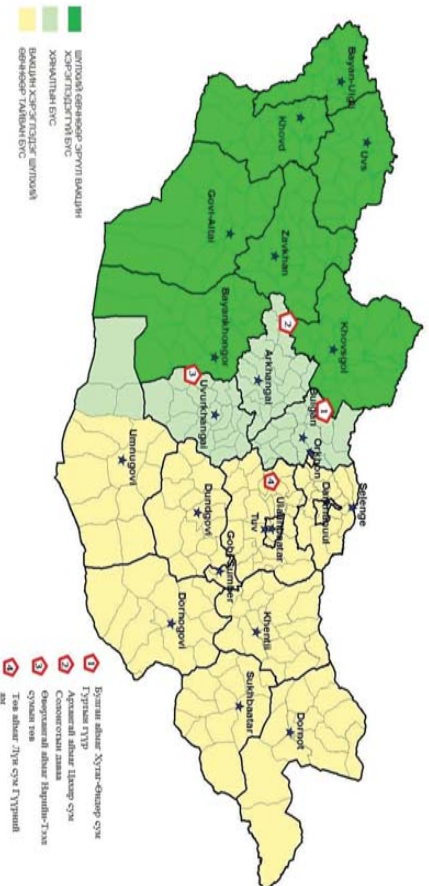
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NSP and SP surveillance during the outbreak in 2014



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FMD control strategy in Mongolia (2015-2020)

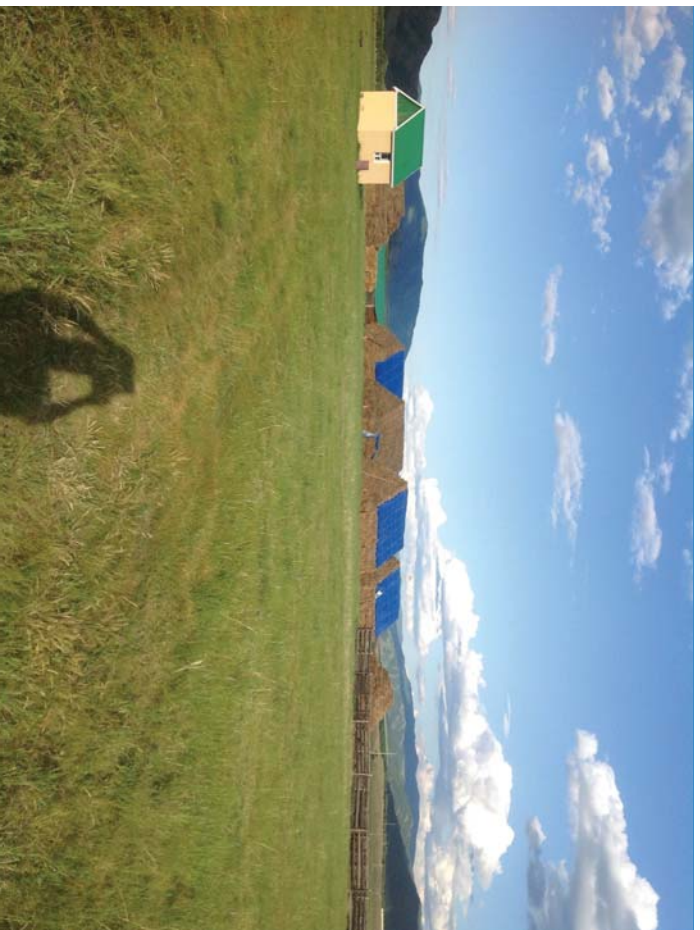


247 DECREE OF MONGOLIAN GOVERNMENT IN 2011
Third Coordination Committee Meeting of the OIE/ITF Project for FMD Control in Asia



ХЯНАЛТЫН ПОСТ





Following up activities of OIE/JTF Project



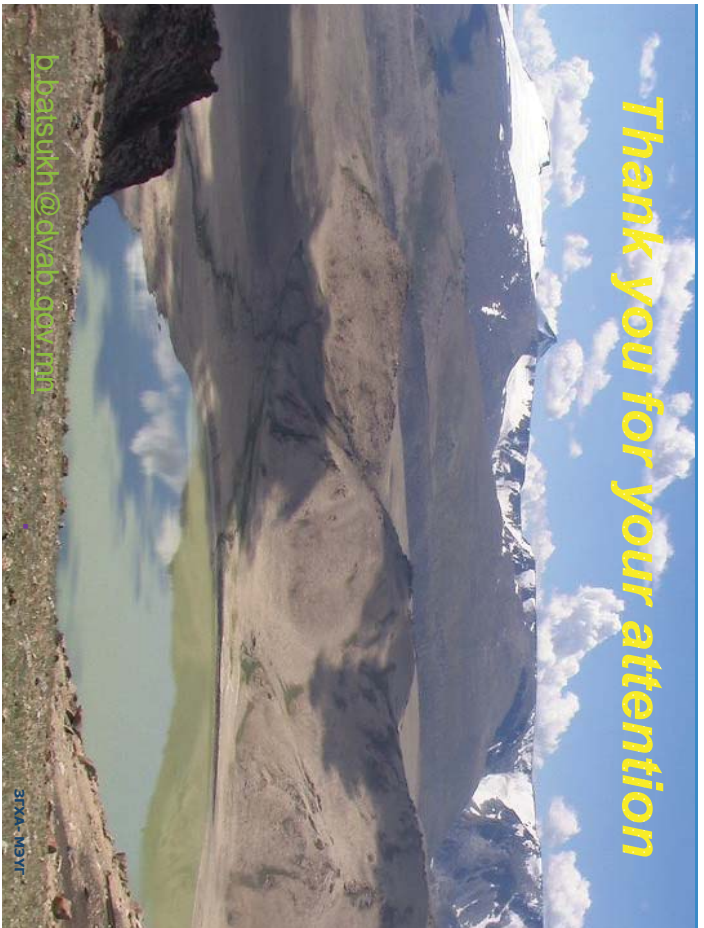
- ❖ Training on diagnosis in Japan (May-Nov, 2012)
- ❖ Experts from Japan for disease investigation (just after outbreak of 2014)
- ❖ Advanced on job training on FMD data analysis and laboratory data analysis in Japan, supported by OIE (Nov 2014)

Future activities



- ❖ Collaboration on FMD free zone work
- ❖ Information sharing network
- ❖ Good quality of FMD vaccine supply
- ❖ Strengthening veterinary capacity-exchange experience
- ❖ Collaboration on other highly infectious diseases
- ❖ More surveillance than vaccination

Thank you for your attention



blatsukh@dvab.gov.mn

SIXA-NEW



OIE/JTF Project on FMD Control in Asia Activities 2013-2014

Chantane Buranathai

OIE Regional Representation for Asia-Pacific

3rd Coordination Committee Meeting, 24-25 September 2014, Lanzhou, China

1



Activities at Regional Level

- Roadmap for FMD Control in East Asia
- 2nd National Contact Person (NCP) Meeting
- 2nd Coordination Committee Meeting
- 1st FMD Scientific Meeting for East Asia
- Laboratory Capacity Building for RL

3

OIE Regional Representation for Asia and the Pacific



OIE/JTF Project on FMD Control in Asia Activities Jan 2013-Aug 2014

- Regional level
 - 2nd National Contact Person (NCP) Meeting
 - 2nd Coordination Committee Meeting
 - 1st FMD Scientific Meeting for East Asia
 - Laboratory Capacity Building for RL
- National level
 - Lao
 - Myanmar
 - Mongolia
- Coordination activities
 - SEACFMD
 - FAO

2

OIE Regional Representation for Asia and the Pacific



Laboratory Capacity Building



Advance FMD Diagnostic Training in Japan
3-14 June 2013
Participant from FMD RRL, Pakchong, Thailand

4

OIE Regional Representation for Asia and the Pacific



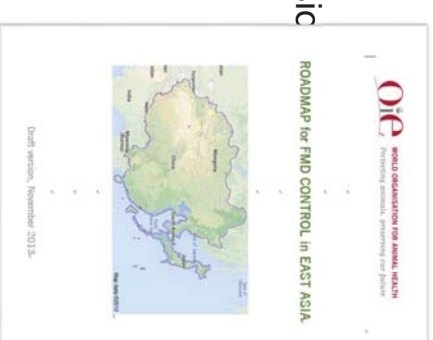
2nd National Contact Person Meeting October 2013, Ulaanbaatar



5

Roadmap for FMD Control in East Asia

Endorsed by
OIE Regional Commission
for Asia, the Far East
and Oceania,
Cebu, Nov 2013



6

Provisional PCP Stage(as of October 2013)

	2011/12	2012/13	2013/14	2014/15	2015/16
PR China	3	3	3	3	3
Chinese Taipei	3	3	3	4*	4/5
Hong Kong SAR	1	1/2	2	2/3	3
Japan	Maintain FMD Free status without vaccination				
RO Korea	3	4*	4*	4/5	5
Mongolia	3	3	3	4	4

*: Chinese Taipei and RO Korea aim to regain FMD free status with vaccination.

7

Visiting State Central Veterinary Laboratory (SCVL),
Ulaanbaatar, Mongolia

October, 2013



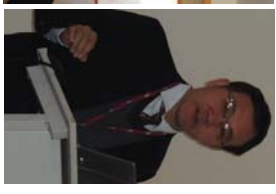


FMD Scientific Meeting for East Asia
Ulanbaatar, Mongolia

October, 2013

FMD Scientific Meeting for East Asia Ulanbaatar, Mongolia, October, 2013

- 34 participants
- 15 scientific papers
- Best presentation awards



Dr Huichen Guo from Lanzhou, P. R. China, received the award for the best presentation.

Recommendations from 2nd CC Meeting

- **Recognized:** FMD status, mid-term activity report, development of Roadmap, progress of activity in Laos, proposal from Laos, Myanmar and Mongolia, as well as FMD activities carried out by other partners
- **Adopted:** the proposed draft Roadmap for FMD Control in East Asia
- **Endorsed:** the recommendations from the 2nd NCP meeting, including updated country profiles and PCP stage classification
- Recommended:

Recommendations from 2nd CC Meeting

- **Recommended:**
 - Close collaboration among projects, partners and SEACFMD
 - Each country to develop National FMD Strategic and Control Plan
 - The support of FMD vaccination campaign and PVM in Laos and Myanmar as proposed
 - Post outbreak surveillance near eastern border of Mongolia
 - Continue communication on harmonize FMD related activities with relevant stakeholders and donors
 - Studies on socio-economic aspects, direct and indirect costs associated with FMD
 - Regularly share epidemiological information

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Activities in Laos 2013-2014

- Public awareness campaign
 - 20 Billboards
- Animal identification campaign
- FMD vaccination campaign
 - 100,000 doses of 6PPD₅₀ Type O Manisa
 - 100,000 doses of 6PPD₅₀ Type A Malaysia 97
- Efficiency study of the vaccine
 - Type 0 (titer at 6-month, after 1 year)
- Capacity building for laboratory and field staffs a
- Publication

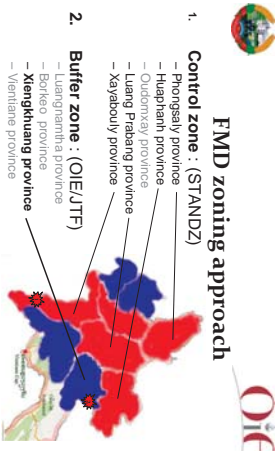
15

Activities at National Level : Laos



□ **Site:** Xiengkhouang Province

□ **Rationale:**



FMD zoning approach

1. **Control zone : (STANDZ)**
 - Phongsavaly province
 - Huaphanh province
 - Oudomxay province
 - Luang Prabang province
 - Xayabouly province
2. **Buffer zone : (OIE/JTF)**
 - Luangnamtha province
 - Borkeo province
 - Xiengkhuang province
 - Vientiane province

1. Buffer zone
2. One hotspot border with Vietnam
3. Livestock production and trade in major source of income

14

Results

- One month after the second shot of vaccine the obtained titer higher than protective level, GMT > 1 : 256
- Protective level has been maintained beyond 6 months (GMT = 1 : 198)
- At 14 month more than 90% of the vaccinated animals still have titer higher than protective level (GMT = 239)

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Outcomes

- No FMD outbreak was reported in Xiengkhouang Province in the past 2 years
- Farmers' awareness of FMD is increase
- Animal identification is well accepted by farmers
- Advocacy from provincial government has been increased

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OIE Regional Representative for Asia and the Pacific



Publication

- "Verification of efficacy of expired foot and mouth disease (FMD) O type vaccines and FMD DIVA test in cattle and buffalo in Lao PDR"
- Manuscript successfully submitted to Journal of Veterinary Medical Science (JVMS)

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OIE Regional Representative for Asia and the Pacific



Activities at National Level : Myanmar



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OIE Regional Representative for Asia and the Pacific



OIE/JTF Project on FMD Control in Asia





Field activity in Myanmar (2013-2014)

- FMD vaccination and public awareness campaign: 100,000 doses, O Manisa in NPT
- Epidemiology study: 20 villages in NPT, NSP testing
- Post-Vaccination Monitoring (PVM): 50 samples, 2 times



Activities at National Level : Mongolia

- Strengthening laboratory capacity
 - Expert visit (2011)
 - Training in Japan (2011)
- Feasibility Study (2014)
 - Advanced training in Japan
 - Epidemiology Data Analysis
 - Laboratory Data Analysis



OIE/ITF Project on FMD Control in Asia



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Feasibility Study for training in Mongolia



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Collaboration Activities

- SEACFMD
- FAO
- China-Mongolia-Russia TADs Control

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OIE Regional Representation for Asia and the Pacific



SEACFMD

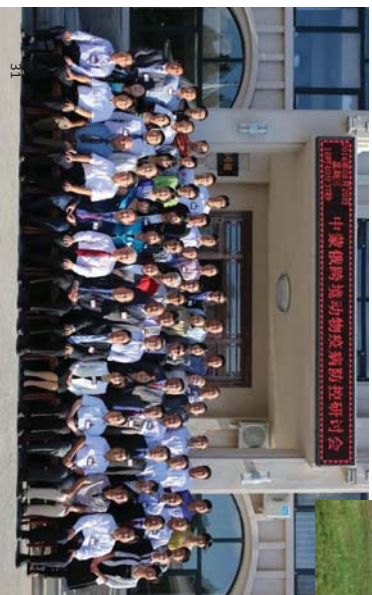
- SEACFMD Sub-commission Meeting
- Upper Mekong Working Group
- Laboratory Network
- Epidemiology Network

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OIE Regional Representative for Asaland the Pacific



4th Tripartite China-Mongolia-Russia Animal Disease Prevention and Control Seminar



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Participate in Mongolia-China-Russia Tripartite FMD Control Activities



1st Meeting in Beijing



2nd Meeting in UB + Russia



3rd Meeting in Vladimir

Future Activities (2014-2015)

- 3rd Coordination Committee Meeting, 24-26 September 2014, Lanzhou, China
- Advance Epidemiology Training in Japan, November 2014
- Advance Laboratory Training in Japan, November 2014
- China/OIE Project on Swine Disease Control in Asia, joint meeting with FAO, Beijing, November 2014
- Training on PPRS in OIE Reference Laboratory, Beijing, 2015
- 4th Coordination Committee Meeting, Tokyo, 2015
- 2nd FMD Scientific Meeting for East Asia, Tokyo, 2015

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OIE Regional Representative for Asia and the Pacific



THANK YOU



Verification of Efficacy of Donated FMD O Type Vaccines in Laos

National Institute of Animal Health (NIAH), Japan Kenichi Sakamoto

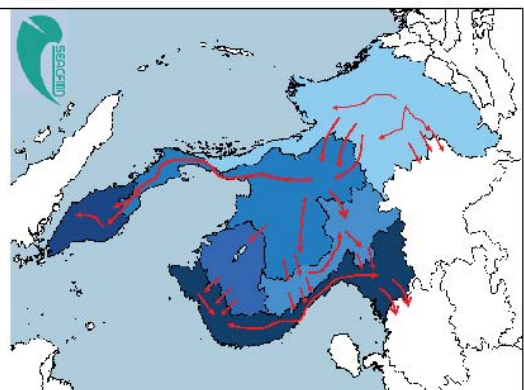
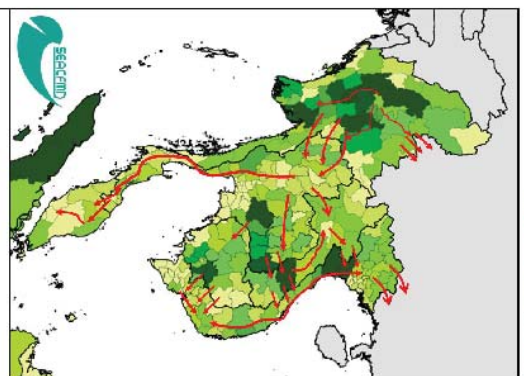


Introduction



- Laos requested Japan 200,000 doses of O MANISA which had been stored for emergency use in Japan in 2012 and another 100,000 doses of O Manisa and type A vaccines were donated in 2014 early.
- About 100,000 heads of cattle and buffaloes were vaccinated twice in one month interval in Xiengkhouang Province, north-east of Laos in 2012 and once in 2014.
- To verify the efficacy of the vaccines, the blood samples were collected from about 200 heads of cattle and buffaloes before, after the 1st and 2nd vaccination in one month intervals and 14 months after the last vaccination.
- The sera were isolated and kept each time in National Animal Disease Diagnostic Laboratory (NADDL) in Vientiane and they were tested by LPB-ELISA

Cattle movement pattern vis-à-vis population and price

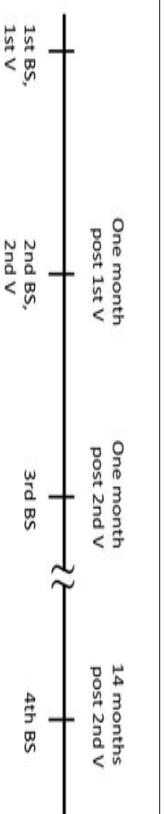


The Characters of the donated FMD vaccines

- Inactivate vaccine
- 6 PD50 O Manisa (Double potency)
- R1 value 0.35 (VNT) with O/JPN/2010, SEA topotype (Mya/99) by NIAH
- Selected in the FMD vaccine meeting every year by MAFF
- Purchased from foreign vaccine makers
- Valid for 1 – 1.5 year
- Discarded after storage
- Donated after storage
- Verified the efficacy of the vaccines by single shot in Myanmar before in small scale



Blood Sampling & Antibody test for verifying the efficacy of the vaccines



2012 Sep. 29 – Oct. 4 Ear-tag for identification
Pre blood sampling (BS 1) & serum isolation
the 1st Vaccination

Nov. 3 – 8 BS 2 (one month after the 1st vaccination) & serum isolation
the 2nd vaccination

Dec. 3 – 8 BS 3 (one month after the 2nd vaccination) & serum isolation
2013 Jan. 14 - 18 Antibody assay by LPB-ELISA in Vientiane Lab (NADDL)
2014 Early Jan. BS4 (14 months after last vaccination)
April Tested by LPB-ELISA in NADDL

Sampling population and the tested numbers

(No. of BS 1 : pre-vaccination)			
Cattle 139	Buffalos 50		
(No. of BS 2 : one month after 1 st vaccination)			
Cattle	106	Sampling ratio	76.3% (106/139)
Buffalos	38		76.0% (38/50)
(No. of BS 3 : one month after 2 nd vaccination)			
Cattle	107	Sampling ratio	77.0% (107/139)
Buffalos	34		68.0% (34/50)
(No. of BS4: In 2014)			
Cattle	57	41.0% (57/139)	
Buffalos	13	26% (13/50)	

90 cattle and 31 buffalos were successful in collecting samples in all three times in this period and used this study (About 60% of the cattle and buffalos).

The several green ear tags of the buffalos were dropped off. It means that about 40% of the cattle and buffalos were still kept in the two villages.



Blood sampling & Vaccination (Perfect combination of Laos and Japan Teams)

(Beer Lao Team) Ear-tags, Keeping cattle & buffalos, Vaccination
(Oishii Team) Blood sampling, Serum Isolation, Record of blood sampling,
Antibody test & technical transfer of the assay



Antibody Detection Assay

(Method)
The antibody assay against type O was tested by LPB-ELISA kit (developed by WRL for FMD) in both screening and titration tests.

(No. tested)	
(1) For the screening test (BS collected 3 times)	Cattle 90 Buffalos 31
(2) For the titration test (pre-vaccination serum samples of the animals whose titers were not more than x32)	Cattle 19 Buffalos 6

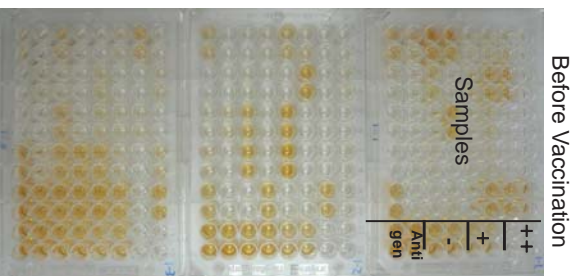


From the screening ELISA test :
-More than 80% of the cattle and buffalos were revealed to be sero-positive against type O before the vaccination.

-By the vaccination, antibody titre of all the animals (cattle 90 & buffalos 31) turned to be higher and by the 2nd vaccination their immunity levels became more higher.

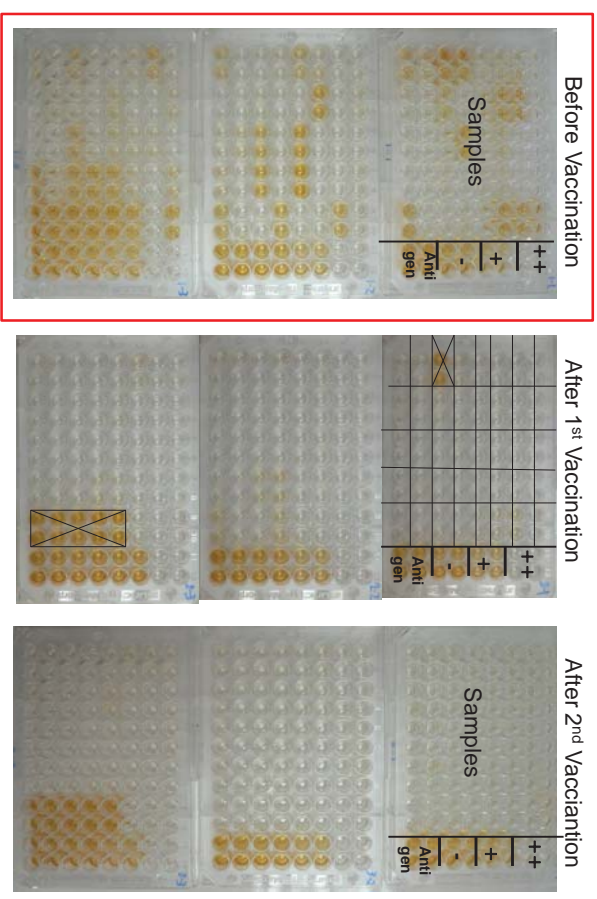
Animals vaccinated even after 14 months still kept enough antibody titers.

Screening Test of samples of "Before" Vaccination by LPB-ELISA



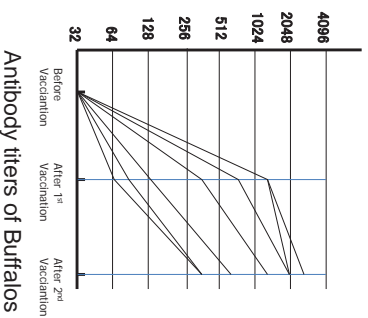
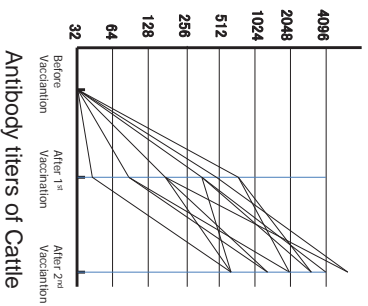
Many samples of before vaccination have high titer.
Cow: 78.9%, Buffaloes: 80.6%

Screening Test of Before and After Vaccination by LPB-ELISA



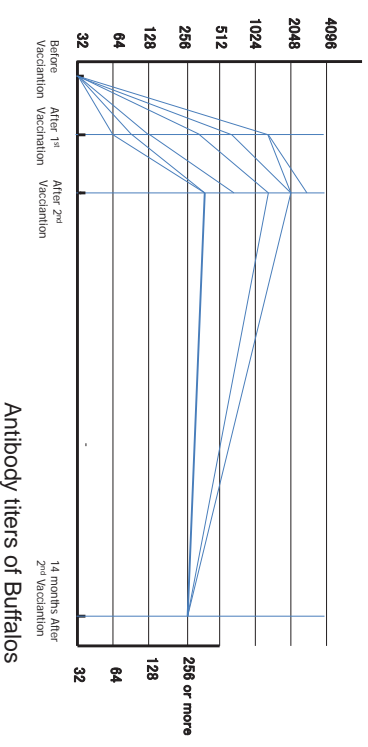
Antibody titers of the cattle and buffaloes whose tiers were less than x 32 before the vaccination

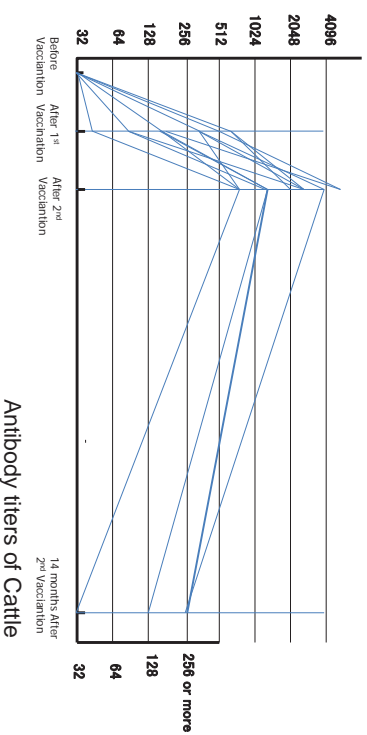
Numbers of samples : 19 cattle and 6 buffaloes whose titer were less than x 32 before the vaccination by the screening test of EPB-ELISA



After 1st vaccination: 1:45-1:1448, After 2nd vaccination: 1:362-1:5792

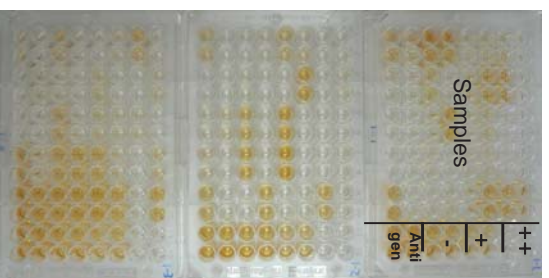
Antibody titers are to be higher and higher after 1st and 2nd Vaccination.





**Screening Test of samples of “Before”
Vaccination by LPB-ELISA**

Before Vaccination



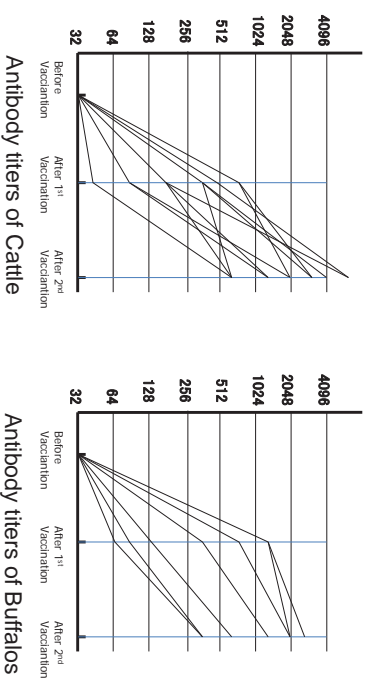
**In the screening test,
Many samples of before
vaccination have high titer.
(45 <, 71 cattle and 25 buffalos)**

Those animals were

**Infected animals? or
Vaccinated animals?**

Antibody titers of the cattle and buffalos whose tiers were less than x 32 before the vaccination

Numbers of samples : 19 cattle and 6 buffalos whose titer were less than x 32 before the vaccination by the screening test of EPB-ELISA



Expired FMD O Type vaccine in this study worked well to prevent FMD infection in both cattle and buffalos

Differentiation between FMD-infected animals and non-infected, vaccinated animals

Kits : PrioCHECK FMD NS

Samples : Animals that had high LPBE titer (45 <, 71 cattle and 25 buffalos)

Examined animals of 76.1% in cattle and 88% in buffalos that had high LPBE titer were judged as FMD-infected animals.

This result suggests that there was no report of FMD outbreaks in this area, but FMD outbreak had occurred in this area in Laos before.

Conclusions

- Even three months passed after expired date, **the vaccine was found to have enough efficacies** by the screening and titration tests with LPB-ELISA.
- There was no report of any side-effects by this 200,000 doses vaccination.
- The vaccines were shipped to Laos just after finishing storage periods from Japan. They were kept under suitable condition and transferred to the vaccination site by good cold chain until used.
- FMD DIVA tests (NSP ELISA kits) for detection of NSPs have characteristics of **high specificity and low sensitivity.**
- About 80% of the animals were already sero-positive against FMDV type O. (No report of FMD outbreak in the two villages for several years and no FMD clinical signs observed within 2 months of this field study, however, FMD DIVA test showed **about 80% of examined animals were judged as FMD-infected animals.**)
- FMD DIVA test can differentiate well between FMD-infected animals and non-infected vaccine animals using the serum samples from both cows and buffalos in the field.

Members of Oishi team for these studies in Laos

(Oishi Team)
Takehisa Yamamoto (Epi, NIAH)
Manabu Yamada (Path, NIAH)
Kazuki Morioka (FMD, NIAH)
Kathiko Fukai (FMD, NIAH)
Toshiyuki Tsutsui (Epi, NIAH)
Norihiko Muroga (Epi, NIAH)
Noriyoshi Ojima (DAH, MAFF)
Josuke Mago (AQS, Yokohama)
Yoshito Katagiri (AHC, Okinawa)
(OLE) Chantane Buranathai
(Laos) Syseng KHOUNSY





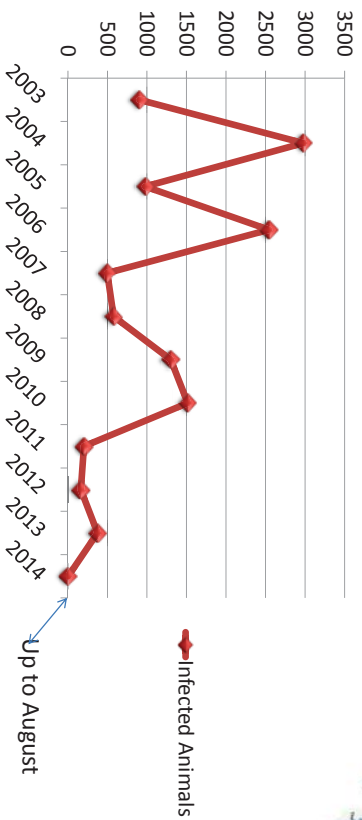
3rd coordination committee Meeting of OIE/JTF project on FMD control in Asia



Country Report of Myanmar

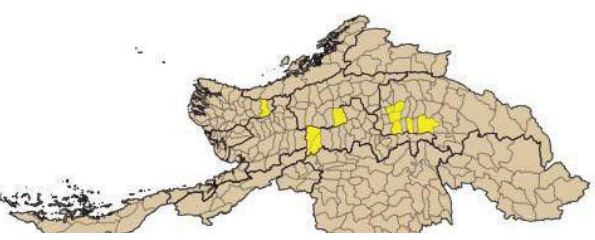
Dr. Khin Sandar Lwin
 BVSc., MPPH (FU-Berlin & CMU)
 National FMD Laboratory

FMD Status in Myanmar



FMD Outbreak OIE (2013)

State/Region	Township	Village	No of Susceptible animal	No. of infected animal	No of samples	Type of virus
Ayeyarwaddy	Myanaung	5	1927	121	3	0
Sagaing	Wetlet	2	25	8	4	0
Sagaing	Kantbahu	1	645	35	3	0
Sagaing	Butalin	1	50	40	3	0
Sagaing	Monywar	2	28	25		
Sagaing	Khin Oo	1	400	21	4	0
Sagaing	Ahyartaw	1	20	10	2	0
Naypitaw	Pobbathiri	1	231	60	3	0
Magway	Natnauk	1	370	55	1	Unfit
Total		15	3696	375	23	

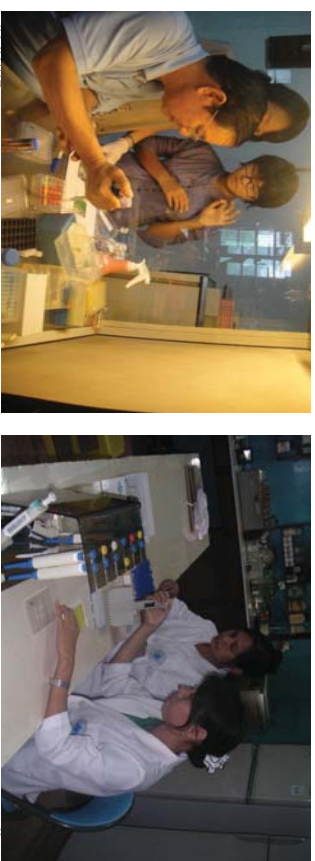


NATIONAL FMD LABORATORY



FMD Diagnostic Capabilities in Myanmar

- Virus Isolation
- Antigen Detection (Indirect Sandwich ELISA)
- Antibody Detection (Liquid Phase Blocking ELISA)
- FMD Nonstructural Protein ELISA



FMD Vaccine Production



- Monovalent Vaccines per year
 - for cattle about 150,000 doses
 - for pig about 50,000 doses

FMD SAMPLES SUBMITTED/TESTS PERFORMED/RESULTS OBTAINED

Year	Type of Samples	Nos. of Samples	Test	Result Obtained	Submission
2009	Specimens (Bago/Ygn)	10	ELISA/PCR	Type 'O' / SEA Topo	WRL
2010	Specimens (Rakhating)	1	ELISA/PCR	Type 'A' / ASIA	WRL
2012	Specimens (2007-08)	17	-	Research Purpose	WRL
2004	specimens	4	ELISA	Type 'O'	RRL
	sera	40			
2005	specimens	3	ELISA	'Asia 1'	RRL
	sera	42			
2007	specimens	5	ELISA	Type 'O'	RRL
2008	specimens	4	ELISA	Type 'O'	RRL
2009	specimens	4	ELISA	Type 'O'	RRL
	sera	464			
2010	specimens	3	ELISA	Type 'A'	RRL
	sera	450			

Serosurveillance in Sagaing Region(2012, OIE Project)

Date	No of Village	Total test serum	NSP Test		Remark
			Pos;	Neg;	
18.6.12	5	57	20	37	Pre-survey
4.7.12	18	243	81	162	Pre-serum
3.8.12	20	393	190	203	Post-serum
19.9.13	2	48	9	39	Regular vaccination (1 year later)
Total		741	300	441	

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Serosurveillance in Kyauk Se District , Mandalay Region(2013 OIE Project)

Date	No of Village	Total test serum	NSP Test		Remark
			Pos	Neg	
25.7.13	44	254	56	213	Pre-serum
20.8.13	28	105	34	71	Post-serum
Total	72	359	90	284	

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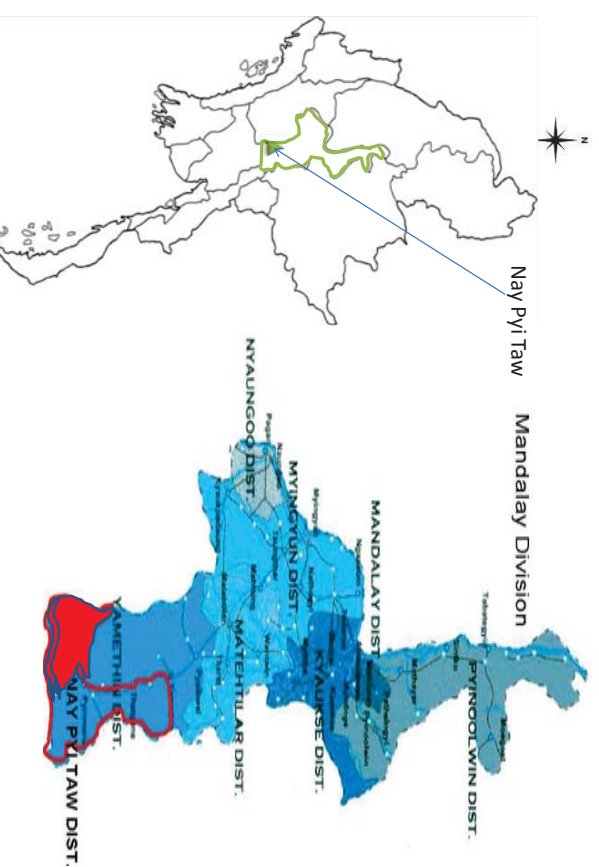
OIE/JTF Project

Epidemiology study and Post-Vaccination Studies in Naypitaw, Myanmar

Objective

- Significant decrease of FMD outbreaks in Asia by strengthening prevention and control measures against FMD

Project site for OIE/JTF Project on FMD Control in Myanmar



FMD Susceptible Livestock Population in Myanmar (2014-15)

	Species	Number		Species	Number
Union	Cattle	15,481,101	Nay Pyi Taw	Cattle	234,445
	Buffalo	3,422,374		Buffalo	68,910
	Sheep	1,162,318		Sheep	-
	Goat	5,615,439		Goat	15,127
	Pig	13,760,958		Pig	258,533

Activities

Total vaccinated animal 54600

Total collected serum 279

Activities

- FMD vaccination and public awareness campaign: 100,000 doses, Type O 6 PD₅₀ in NPT
- 8 townships and 2 dairy farms in NPT, NSP testing
- Post Vaccination Monitoring : 50 samples
(Pre and post serum of vaccination from 2 dairy farms were tested by NSP and LP ELISA)

FMD Vaccination in Dakhina District, Nay Pyi Taw Council Region

January 2014

No	Township	Total village tract	Total village	Buffalo	Cattle	Total vaccinated animal
1	Pyinmana	5	73	1936	8064	100,00
2	Zabuthiri	4	7	98	302	400
3	Dakinathiri	10	10	780	2220	3000
4	Leway	57	212	2550	17450	200,00
	Total	96	322	5364	28036	33400

FMD Vaccination in Oakthara District, Nay Pyi Taw Council Region

January 2014

No	Township	Total village tract	Total village	Buffalo	Cattle	Total vaccinated animal
1	Oaktharathiri	14	21	1102	1898	3000
2	Popbathiri	14	49	374	3826	4200
3	Zayyarthiri	20	43	1233	2767	4000
4	Takkone	22	58	370	9630	100,00
	Total	70	171	3079	18121	21200

Post-vaccination NSP Result

Township	Total collected serum	Positive	Negative
Pyimmana	50	20	30
Otayathiri	10	8	2
Zayyarthiri	10	1	9
Pobathiri	10	2	8
Tetkone	29	12	17
Dakinathiri	10	4	6
Unison	30	3	27
Supercow	20	-	20
Total	169	50	119

Pre-vaccination NSP Result

Township	Total collected serum	Positive	Negative
Zabuthiri	10	3	7
Leiway	50	15	35
Unison	30	2	28
Supercow	20	4	16
Total	110	24	86

Result from Dairy Farms in Naypyitaw

Pre-vaccination serum collection date: 20/1/2014

Post-vaccination serum collection date: 17/2/2014

Total collected serum: 50 samples

Dairy Farm	NSP (pre-vaccination)		NSP (post vaccination)		LPBE (pre-vaccination)		LPBE (post vaccination)	
	Pos:	Neg:	Pos:	Neg:	Pos:	Neg:	Pos:	Neg:
Unison	2	28	3	27	14	16	22	8
Supercow	4	16	-	20	9	11	13	7
Total	6	44	3	47	23	27	35	15

Public awareness for FMD Vaccination Campaign



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Serum collection



Vaccination



Ear Tag

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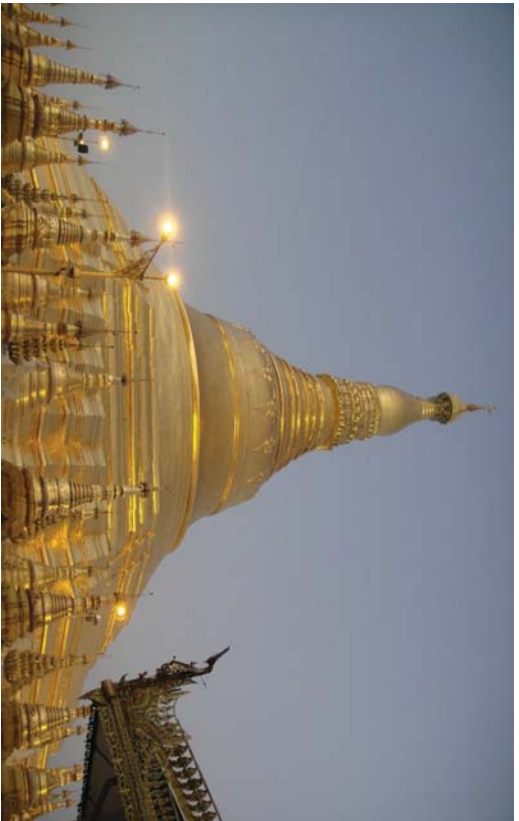
Public Awareness Tools



Future Activities

- To promote the vaccine production capacity
- Strengthening the outbreak reporting system
- Conducting public awareness for farmers and traders
- Developing National FMD Control Program
- Conducting Vaccination in high risk areas
- More sero-surveillance program for epidemiological studies in the country
- New FMD Laboratory will be established by the aid of KOICA, Korea in 2014

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Thank you!



**OIE/JTF Project on FMD Control in Asia
Planned Activities 2014-2015**

Chantane Buranathai

OIE Regional Representation for Asia-Pacific

3rd Coordination Committee Meeting, 24-25 September 2014, Lanzhou, China



Future Activities (2014-2015)

2015

- FMD Seminar in Laos, January 2015, Vientaine
- 4th Coordination Committee Meeting
- 2nd FMD Scientific Meeting for East Asia

3



Future Activities (2014-2015)

2014

- Advance Epidemiology Training in Japan, 24 November – 13 December, 2014, NIAH, Tsukuba
- Advance Laboratory Training in Japan, 24 November – 3 December, 2014 NIAH, Tsukuba & Kodaira

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Possibly Activities in 2015

(need further discussion)

- FMD vaccination campaign in Xieng Khouang including PVM
 - Vaccinate in April or May
 - Encourage submission of dossier
 - NSP survey
- Another 100,000 doses of Type O to be considered
- Publish study results from Mongolia.
- FMD seminar in Mongolia

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THANK YOU



Scientific Meeting of FMD 2015

Purpose and Goal:

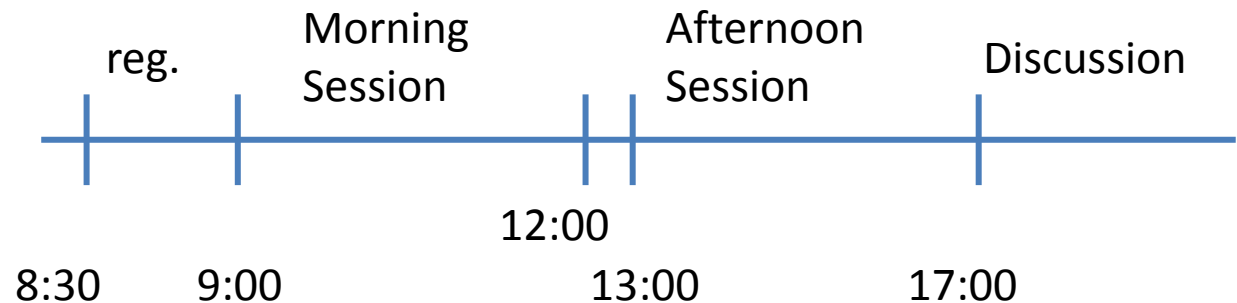
Sharing the information of FMD research works by the Laboratories in the members and to develop future research collaborations between the laboratories

Design of the Meeting:

- (1) Oral (20-30 min) presentation on any resent or on-going FMD research works
- (2) At least two topics from each member or group
- (3) One hour for each country or group
- (4) One day meeting (ex. Starting 8:30 - Finishing 18:00)
- (5) By young researchers
- (6) Chaired by Senior researchers of own country or region
- (7) Select one best presentation

Time and Place:

- (1) July 2015 ?
- (2) Japan ?
- (3) Tokyo Uni.?



Budget: Supported by OIE /JTF

Time Course