15th Meeting of the Upper Mekong Working Group

on Foot and Mouth Disease Zoning and Animal Movement Management

Vaccination and Monitoring Experience

MYANMAR

Dr. Aung Ko Ko Minn
Veterinary Research Officer
Livestock, Breeding and Veterinary Department

Outline of the presentation

- FMD vaccination strategy
- Success Story of FMD free
- PVM study design/methodology
- PVM results and conclusions
- Discussions on how to use the PVM results to guide future vaccination campaign activities.

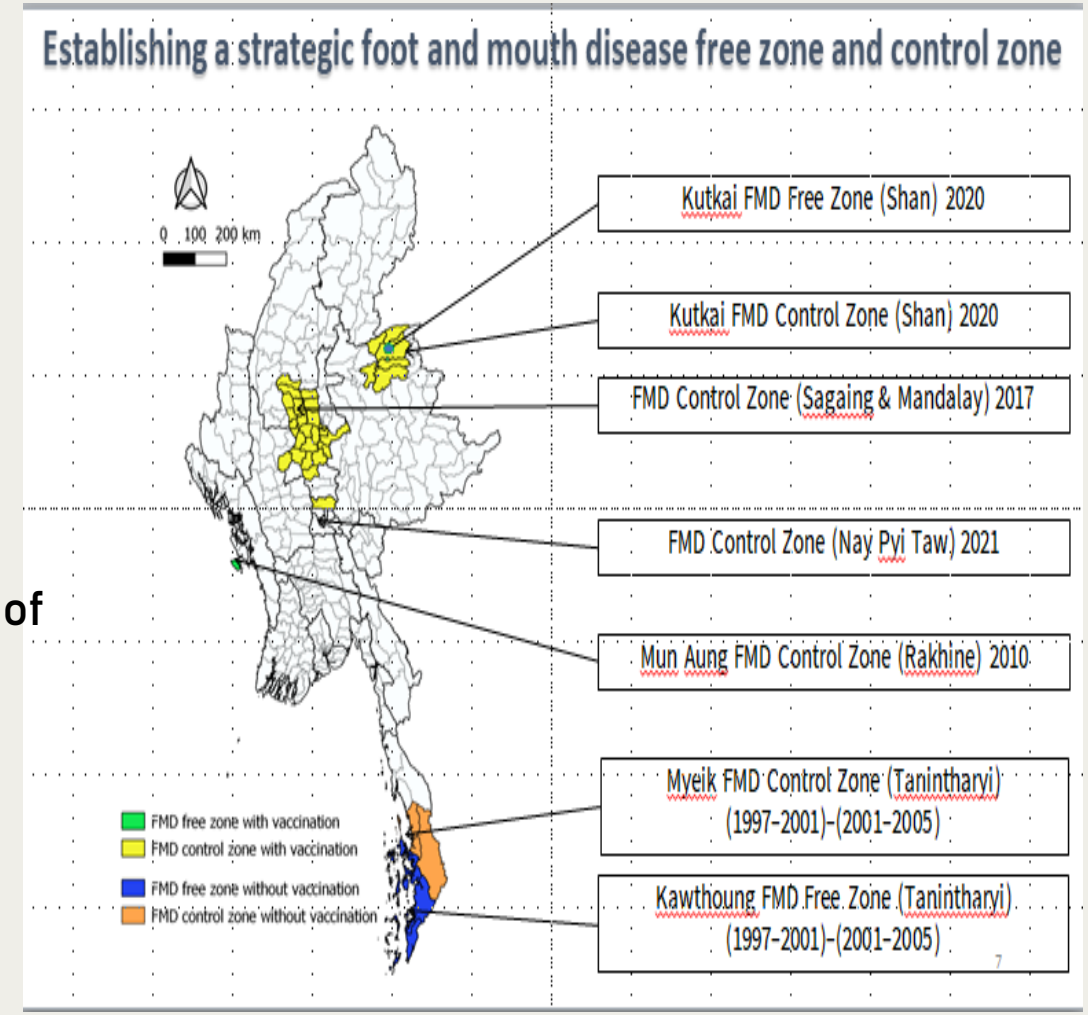
FMD Vaccination Strategy

Vaccination Projects

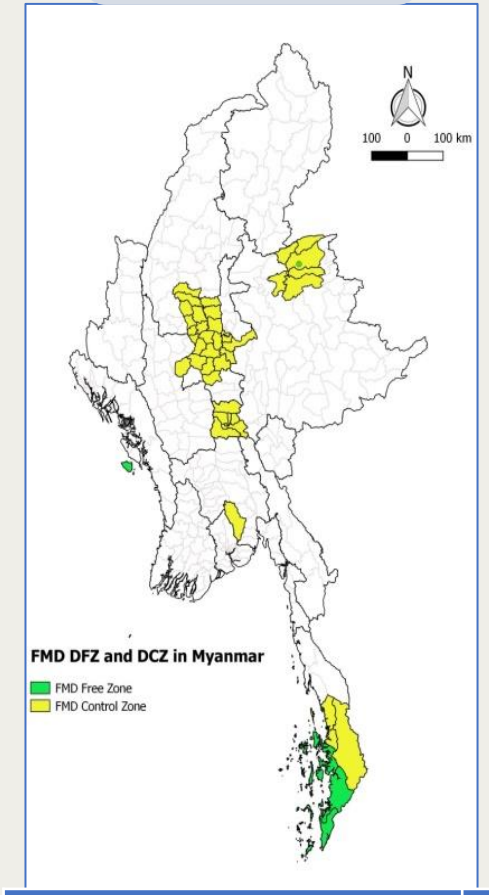
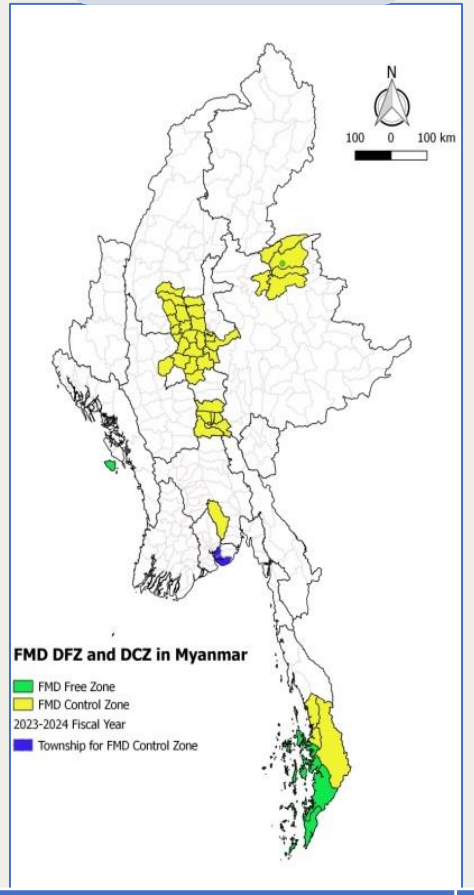
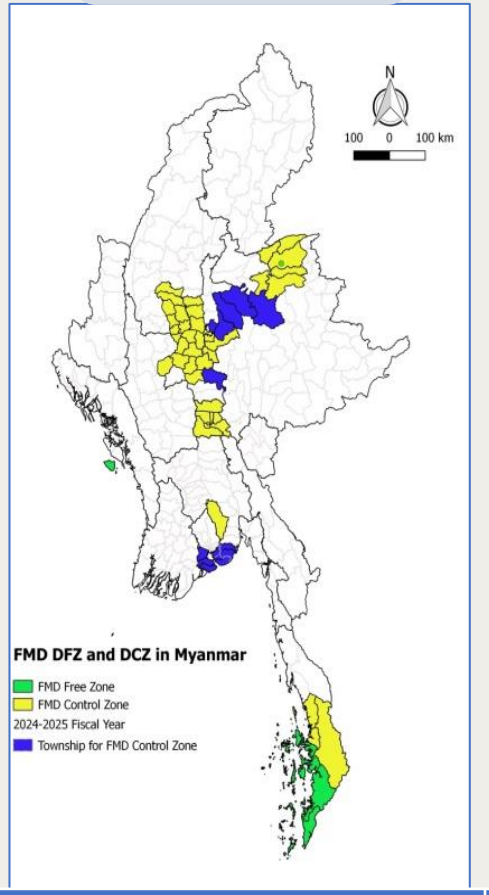
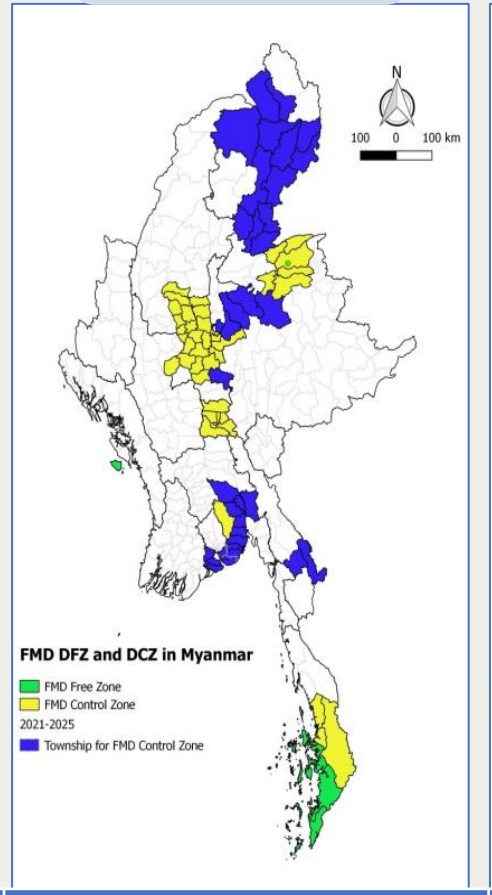
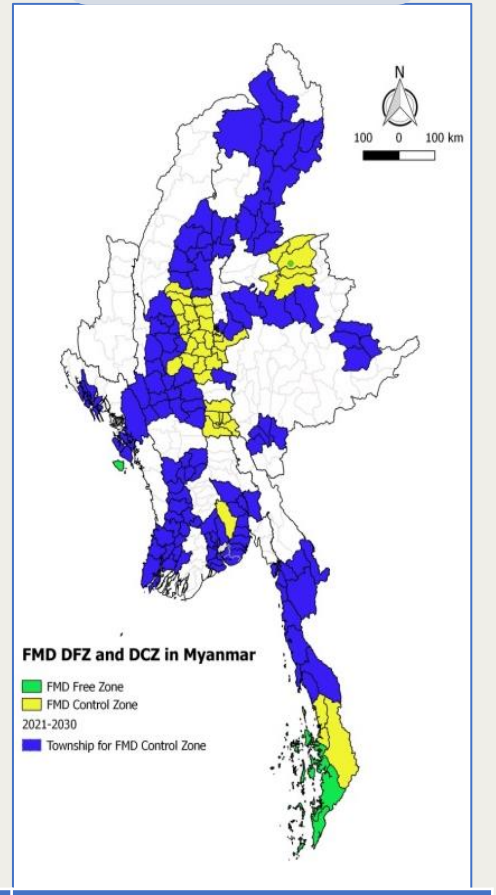
- Vaccination Projects developed under National FMD Plan in strategic areas in Myanmar using zoning approach
  - Large population of cattle & buffalo
  - Significant and potential source for trade to markets throughout SE Asia and China

Approach:

- Controlling FMD at source can reduce risks in other parts of the region (progressive zoning approach)



FMD Control using Progressive Zoning Approach in Myanmar (2021-2030)

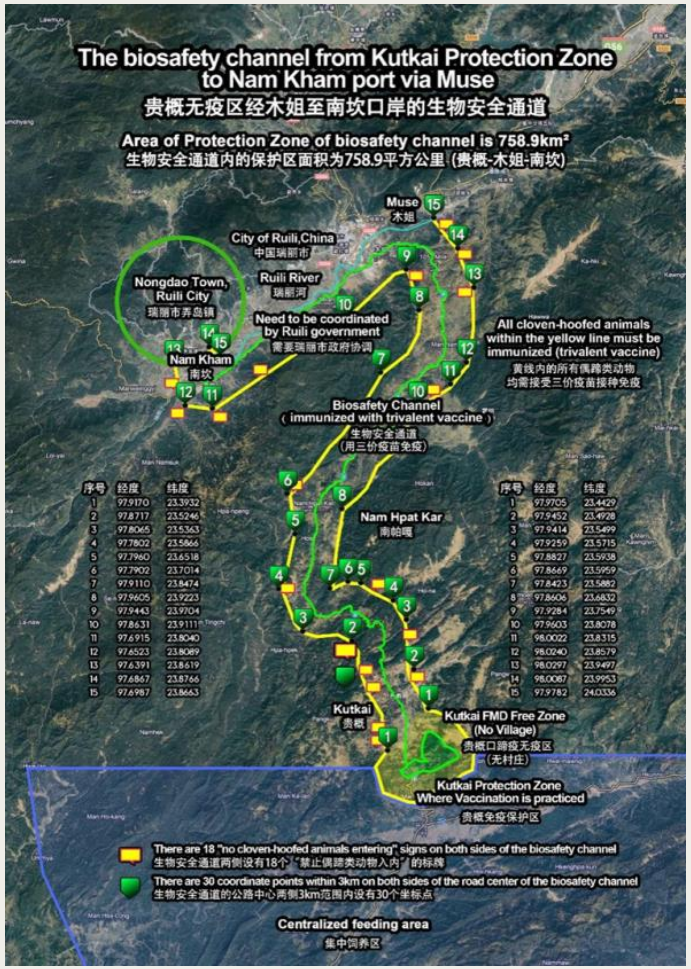
2021–2023	2023–2024	2024–2025	2021–2025	2021–2030
				
(30) %	(33) %	(40) %	(50) %	(80) %

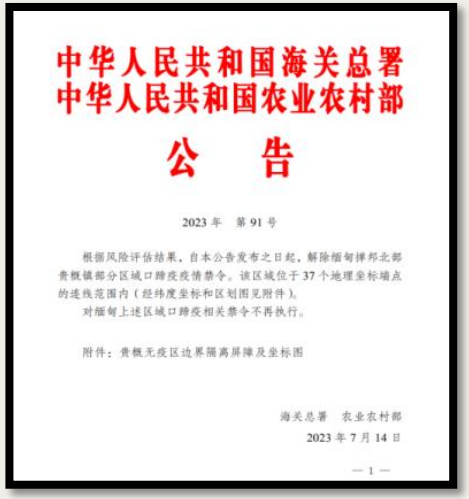
FMD Control Zone Coverage with progressive zoning approach in Myanmar to achieve 2030 Vision

FMD Control using Zoning Approach

A Success Story

- On Dated(14-7-2023) The General Administration of Custom China and Ministry of Agriculture and Rural Affair (MARA) officially announced acceptance of FMD free Zone on Myanmar (cross border trade)




中华人民共和国海关总署
中华人民共和国农业农村部

公　告

2023 年　第 91 号

根据风险评估结果，自本公告发布之日起，解除缅甸掸邦北部贵概镇部分区域口蹄疫疫情禁令。该区域位于 37 个地理坐标端点的连线范围内（经纬度坐标和区划图见附件）。

对缅甸上述区域口蹄疫相关禁令不再执行。

附件：贵概无疫区边界隔离屏障及坐标图

海关总署　农业农村部

2023 年 7 月 14 日

Vaccination Projects in Myanmar (in past)

Background

Central Myanmar FMD Vaccination Projects, 2015 and 2016

- February and March 2015:
  - 500,000 doses of monovalent O vaccine
- March 2016:
  - 300,000 doses of monovalent O vaccine

Targeted to Townships and Villages considered high risk based on outbreak data, location and livestock populations

Ongoing Vaccination Projects in Myanmar

Background

Myanmar FMD Vaccination Ongoing Projects, 2020 and 2023, 2024

- Kutkai FMD Free Zone Regular vaccination Project (2020-2024)
  - 300,000 doses of trivalent O, A, Asia-1 vaccine
- Nay Pyi Taw FMD Control Zone project(2022-2024, ….)
  - 300,000 doses of monovalent O vaccine
- Meikhtilar FMD Control Zone Project(2023-…..)
  - 150,000 doses of monovalent O vacine
- Bago FMD control zone project (2023…..)
  - 100,000 doses of monovalent O vaccine

Targeted to Townships and Villages considered high risk based on outbreak data, location and livestock populations

Why PVM study is Needed?

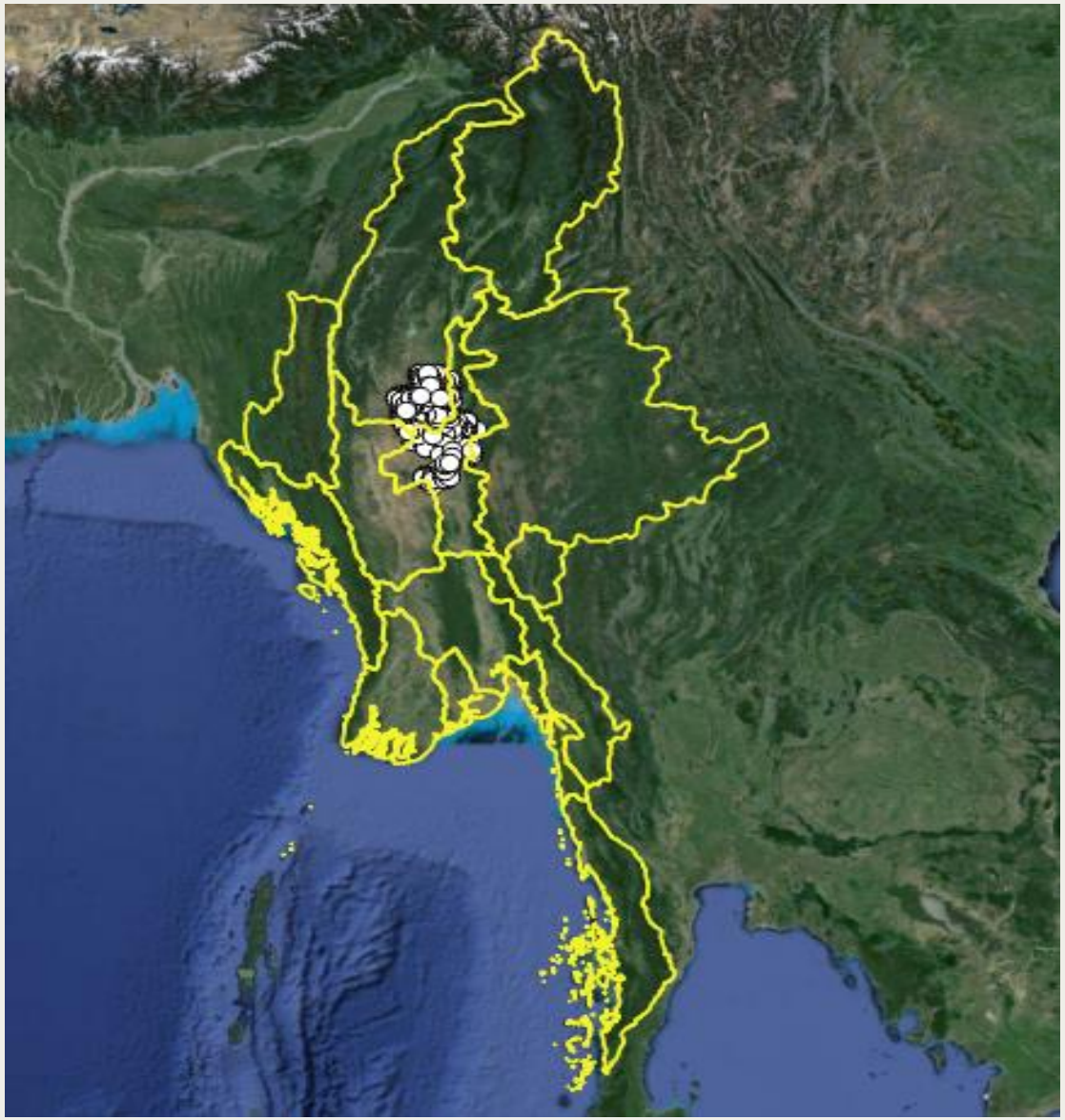
Need to:

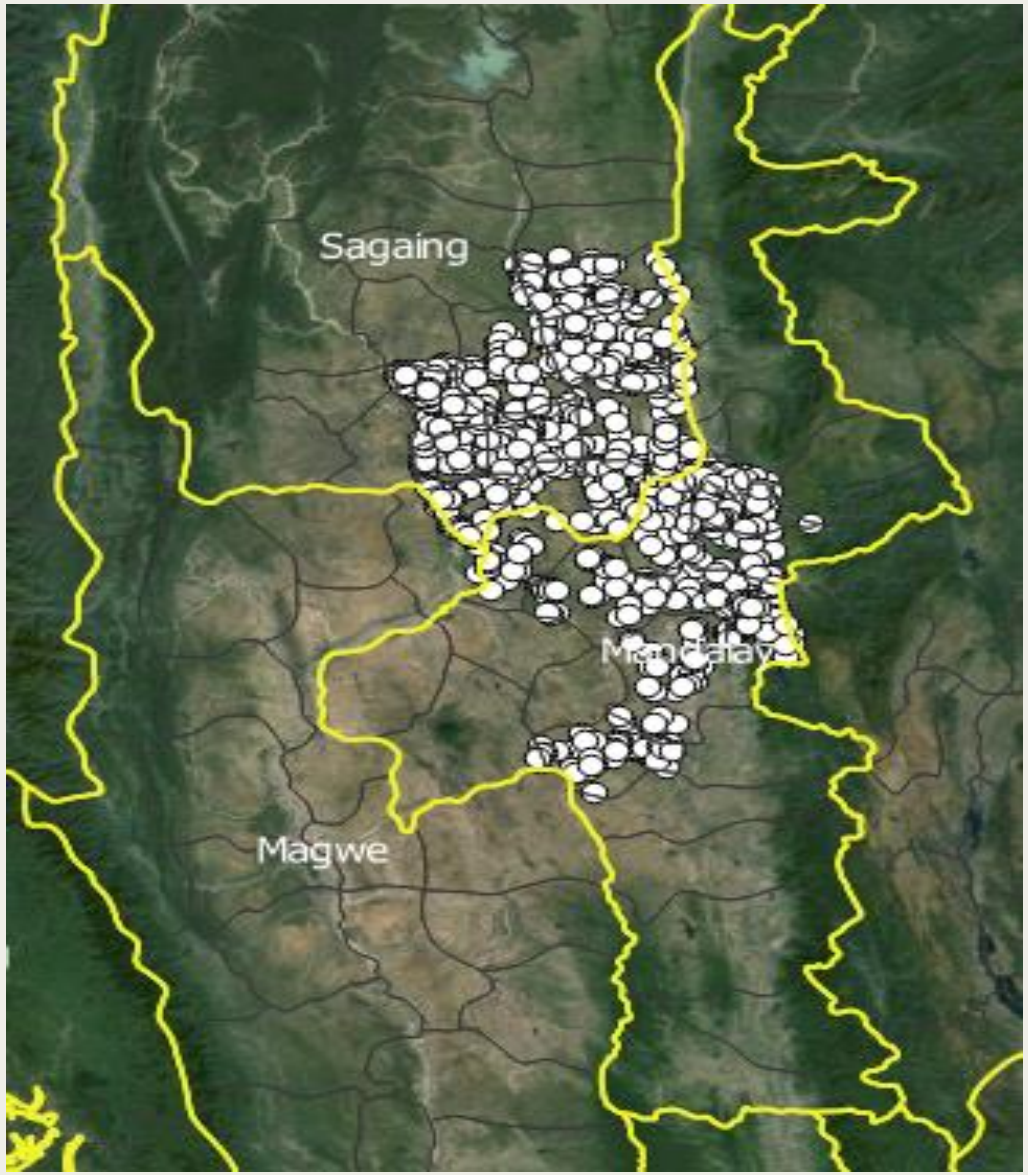
- confirm that the vaccines are effective.
- demonstrate that the vaccinations produce protection.
- measure the proportion of the population that develops protection (aim is 80%).
- use data to understand outbreaks if they occur.

PVM Methodology

- Quality Vaccine
- Vaccine delivery and coverage
- Vaccine response (population immunity)
- Vaccination outcomes (incidence of disease and infection)

Vaccinated Villages 2015 & 2016

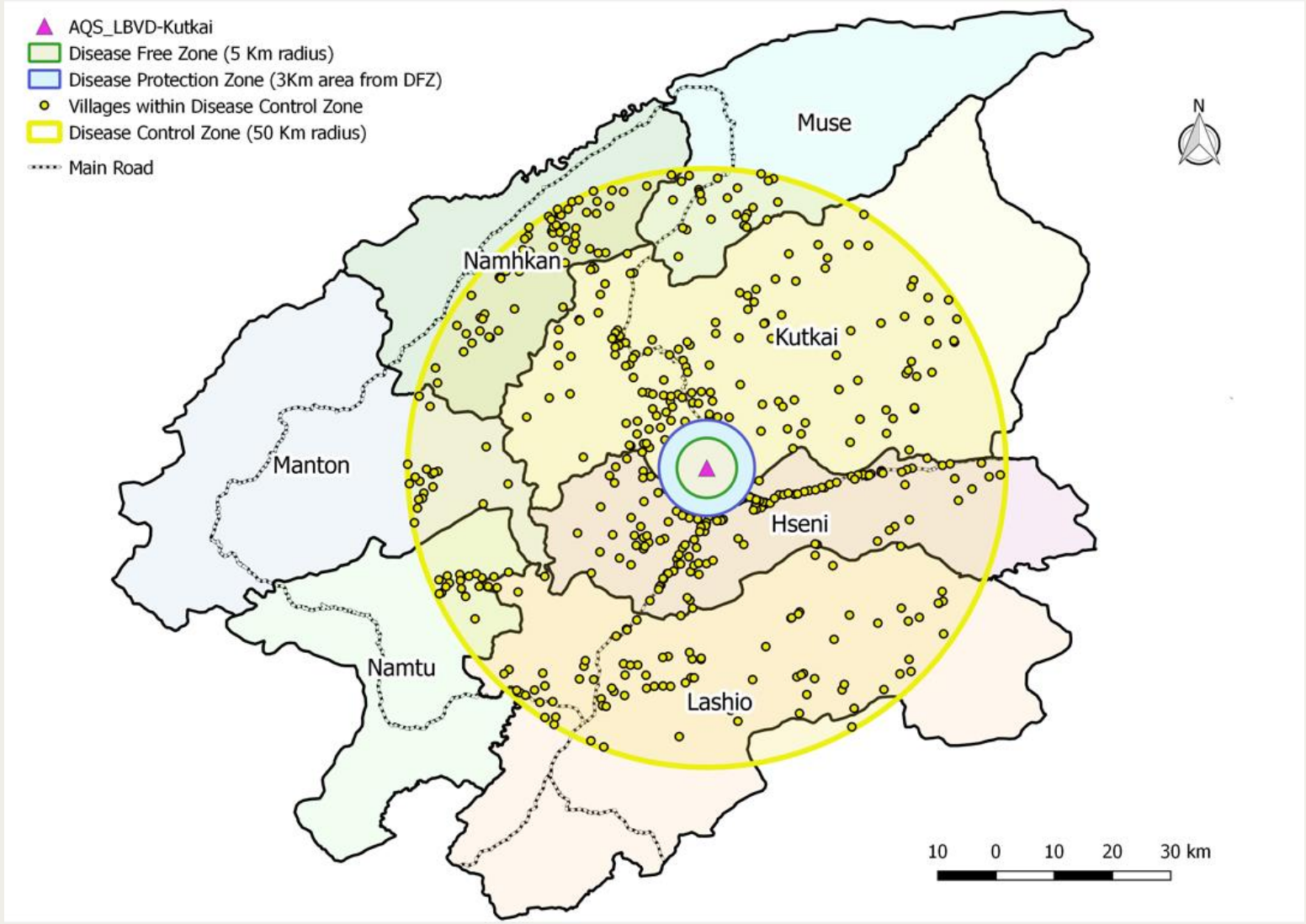




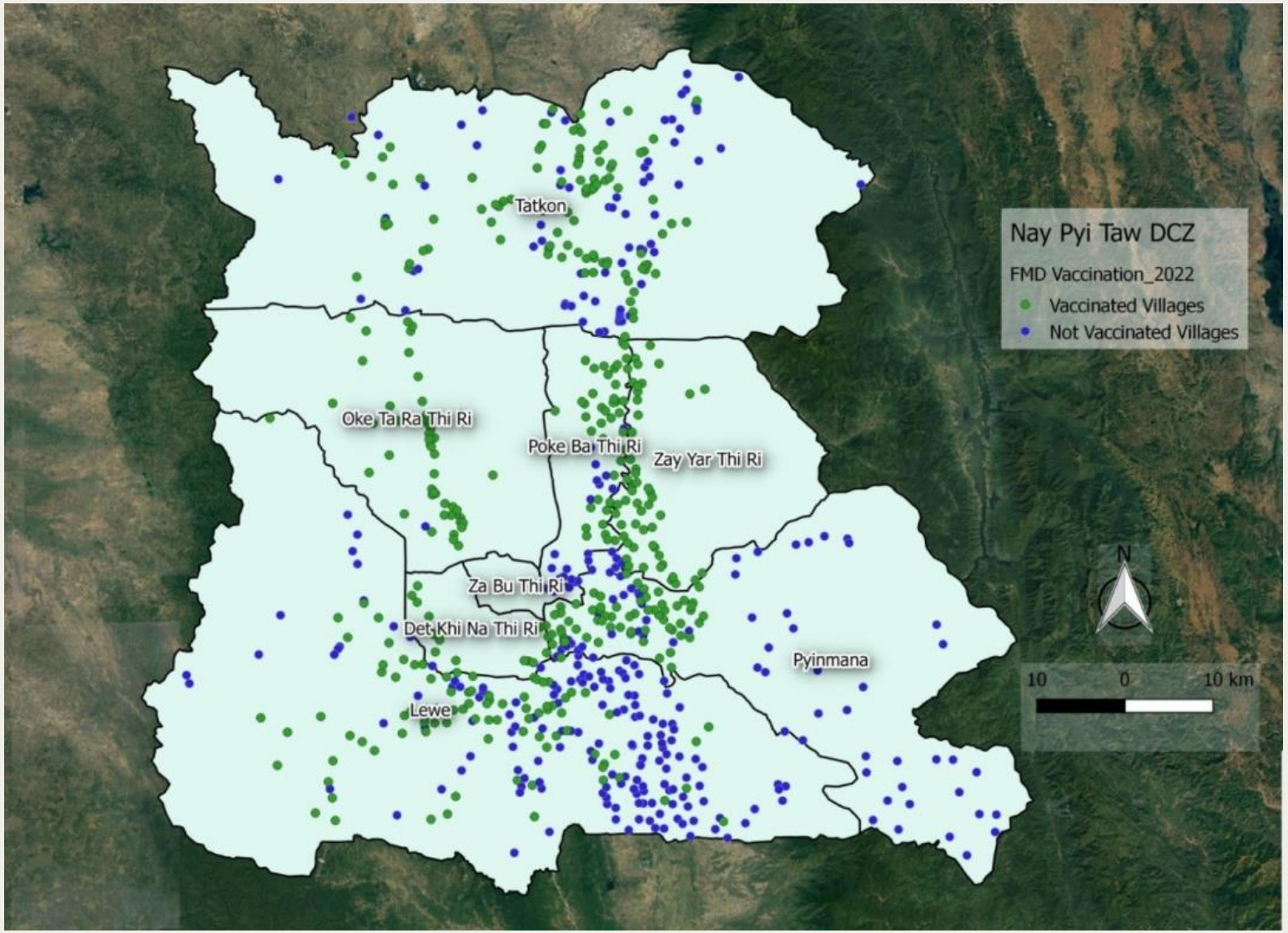
Vaccinated Villages Kutkai FMD Free Zone (2021) - ongoing

(According to signed GACC protocol)

- Free zone
- Protection zone
- Biosafety channel
- Control zone



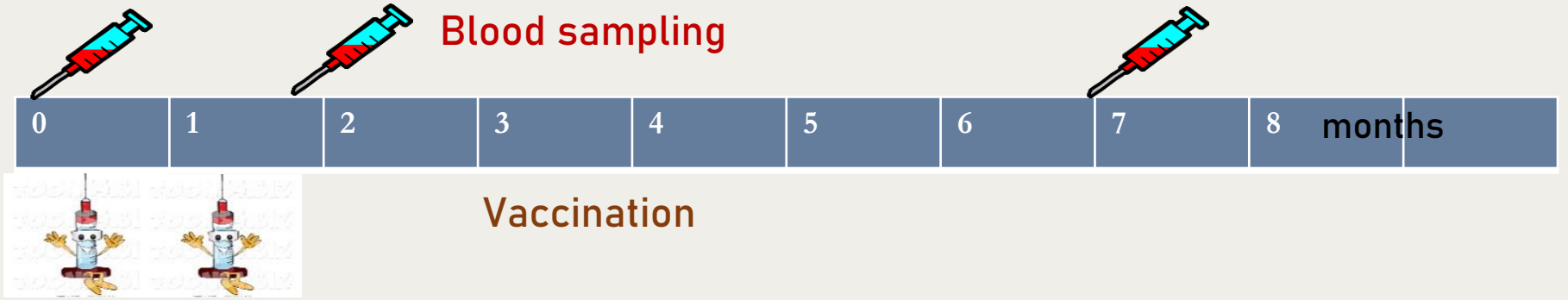
Vaccinated Villages in Nay Pyi Taw FMD Control Zone (ongoing project)



Study 1 – Response to Vaccination

- Randomly selection of 120 vaccinated cattle aged 6-12 months
  - Across multiple townships & villages (readily accessible)

- Collect blood samples at:
  - Day 0 (1st vaccination)
  - Day 30 (2nd vaccination)
  - Day 60
  - Day 210
  - +?



Study 1 – Response to Vaccination

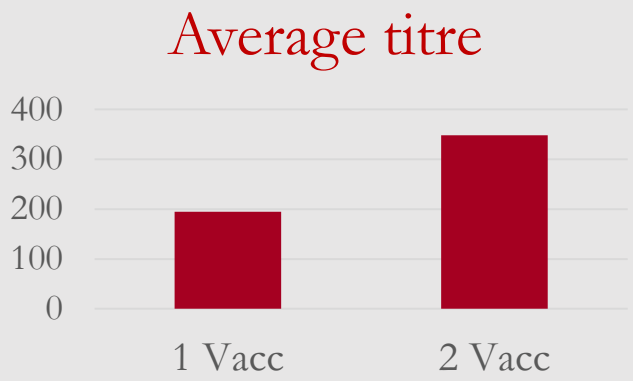
- Measure NSP antibody
  - Reject animals with positive results
  - Ensure have at least 70 animals remaining

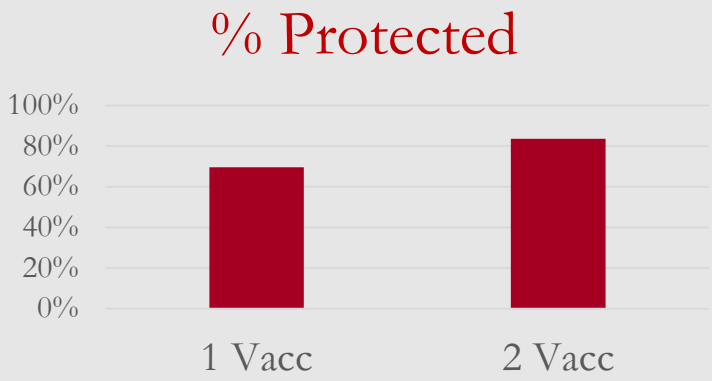
- Measure LP ELISA antibodies to the homologous vaccine viruses in remaining animals, at all time points

This will tell us:

- What % of the animals respond to vaccination;
- What % develop protective antibody levels;
- How long that antibody remains above the protective level.

Results from Study 1





84% protected after 2 vaccinations; therefore, need to vaccinate 95% of livestock in each village to ensure that 80% are protected:

84% X 95% = 80%

Study 2 – Response to Vaccination

- Measure LP ELISA antibodies to the homologous vaccine viruses in remaining animals, after 3 to 6 monhis time points

This will tell us:

- What % of the animals respond to vaccination;
- What % develop protective antibody levels;
- How long that antibody remains above the protective level.

Result from Study 2 (kutkai FMD free zone)

No.Time	Description	No. of Village	2021					2022				
			Period	Population	Vaccinated Animal	Vaccine Coverage	Antibody Titer (Type O, A and Asia 1)	Period	Population	Vaccinated Animal	Vaccine Coverage	Antibody Titer (Type O, A and Asia 1)
1	Disease Free Zone	0	–	–	–	–	–	–	–	–	–	–
2	Disease Protection Zone	15	Feb 2021	2,119	1,824	86.1 %	100 %	Feb 2022	2,898	2,634	90.9 %	100 %
			Aug 2021	2,535	2,270	89.6 %	100 %	Aug 2022	2,941	2,649	90.1 %	100 %
3	Biosafety Channel	129	Jan 2021	14,000	9,750	82.7 %	84.0 %	Feb 2022	14,071	9,890	70.3 %	93.3%
			July 2021	14,063	10,134	72.1 %	89.9 %	Oct 2022	14,128	11,827	83.7 %	87.8 %
4	Disease Control Zone	405	–	–	–	–	–	Mar 2022	88,000	71,390	81.0 %	Not tested
			–	–	–	–	–	Aug 2022	89,000	70,700	79.0 %	Not tested

Study 3 – Population Immunity (Ongoing)

- Randomly select 410 cattle and buffalo across 27 randomly selected vaccinated villages (epidemiology unit)
- Selection will be from the entire population, not just vaccinated animals (but need to record whether they were vaccinated or not)

- Need to be across 3 age groups:
  - 6-12 months (7 animals)
  - 12-24 months (4 animals)
  - >24 months (2 animals)
  - 2 additional animals of any age groups

Study 3 – Population Immunity

- Study starts between 1-6 months after the last vaccination
- Collect a single blood sample from selected animals;
- Measure NSP and virus-specific LP ELISA antibodies.

This will:

- Measure what % of the population, across all villages and townships, is protected;
- Determine the value of the programme;

Summary

- PVM study indicates success of FMD progressive zoning with vaccination project vaccination in strategic locations Myanmar
  - Good vaccination coverage
  - Good Protective coverage (herd immunity)
- It indicated the needs for boostering.

Thank you for your attention