

# **Wildlife Disease Surveillance - Nepal**

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# Wildlife Disease Surveillance

- Stage of Prioritization of Disease and Species
- Testing protocol and in country and abroad diagnostic ability for priority diseases





# Diagnostics

	A	B	C	D	E	F	G
1	Diagnostic protocols for priority diseases			* Tests under development			
2							
3	<b>Viral diseases</b>	Target species (from table)	Diagnostic tests (*indicate OIE pref)	Sample type required	NTNC Lab available	Nepal available (list lab)	Preferred outside Lab
4	Foot and Mouth Disease	Ungulates, Elephant, Rhinoceros, all porcine	ELISA	Tissue, Oesophageal - pharyngeal fluid	Yes	AFU	
5			CFT		No		
6			PCR		Yes*		
7	Canine Distemper	All Carnivore	Virus Neutralization	Serum	No		
8			Rapid antibody test	Serum	Yes (if accurate kit available)		
9			RT - PCR	Smear of conjunctival, vaginal, tracheal or other epithelium, buffy coat of blood, urine sediment	Yes		
10	Canine Parvovirus	All Canid species	Antigen Rapid test	conjunctival discharge, from nasal, buccal mucosa	Yes (if kit available - Vetall/Senspert)		
11			Antigen Rapid test	Serum	Yes (if kit available - Vetall/Senspert)		
12			ELISA	Feces	No		
13	PCR	Yes*					
14	Blue Tongue	Ruminants	Virus Isolation	Tissue, blood in heparin, aborted and congenitally infected new born	No		





# Tuberculosis



# TB: A One-Health Disease





The background of the slide features a faded, grayscale image of an elephant's head and trunk, positioned centrally. The elephant's trunk is thick and tapers slightly towards the tip, which is curled upwards. The head is visible on the right side, showing the ear and part of the face. The overall image is semi-transparent, allowing the text to be clearly legible.

# Elephant Tuberculosis in Nepal



# History

02-04

- 1<sup>st</sup> TB case - patrol bull
- 2<sup>nd</sup> TB case

2005

- Trunk Wash Testing done on TB (9.25% Positive)

2008

- Treatment started





# Nepal TB Case: Airabat Gaj



2006: Stat-Pak +  
MAPIA – DPP –  
2007: DPP + died



# Tuberculosis surveillance in Elephant

- Population identified: 279 elephants
- Tested: 254 (91%)
- Annual Surveillance with DPP kit (Chembio)





# Summary of Treated Elephants

- Total # elephants treated: 61
  - Government: 17
  - Private: 41
  - NTNC: 3











# **Canine Distemper (CDV)**



# CDV Surveillance in Tiger

- Serum from rescued, tissue from Dead
- 11 serum sample from tiger exported to Cornell University for 8 panel of disease.





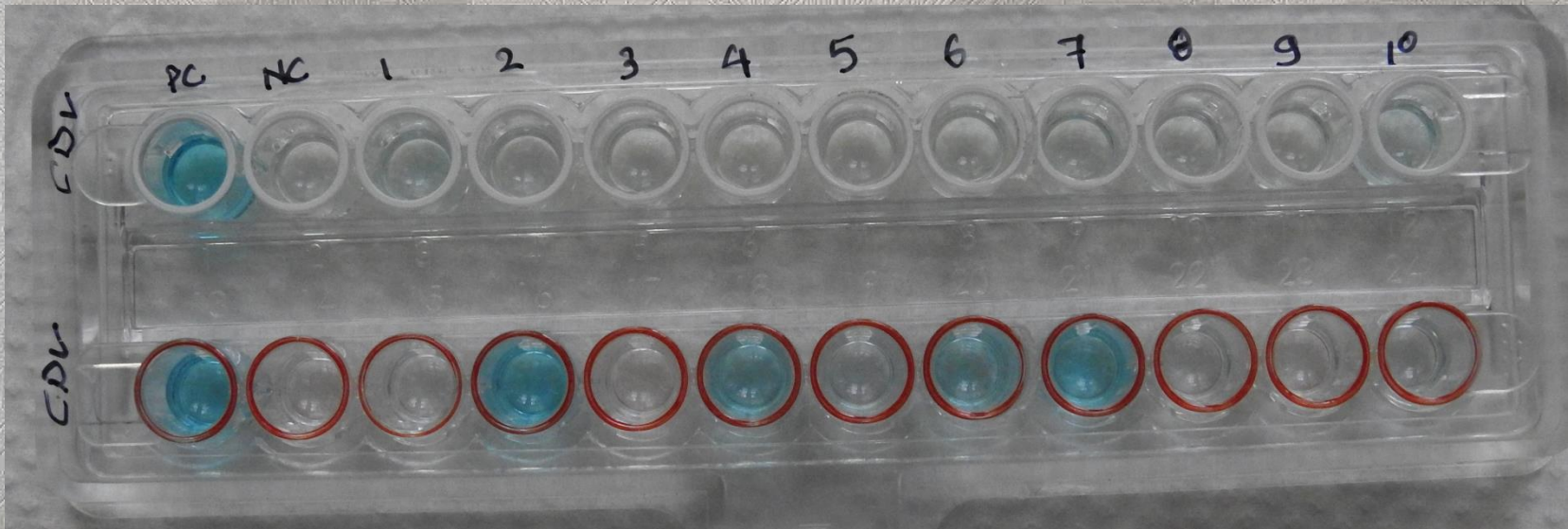
- **11 Serum sample from rescued Tiger (2011-2016) sample exported to Cornell University and tested for 8 diseases and results:**

<b>Disease</b>	<b>Number of positive</b>
Feline Coronavirus (FCOV)	1
Feline Immunodeficiency virus (FIV)	0
Feline Leukemia (FeLV)	0
Feline Herpesvirus (FVR)	5
Canine Distemper Virus (CDV)	0
Canine Parvovirus – 2 (CPV-2)	8
Leptospirosis (7 Serovars)	6
Toxoplasmosis	10



# Disease of Wild Carnivore

- Canine Distemper and Canine Parvovirus in all rescued tiger
- Disease study in Feral dog and its role of disease transmission in wild carnivore



**CDV and CPV testing in wild Tiger**



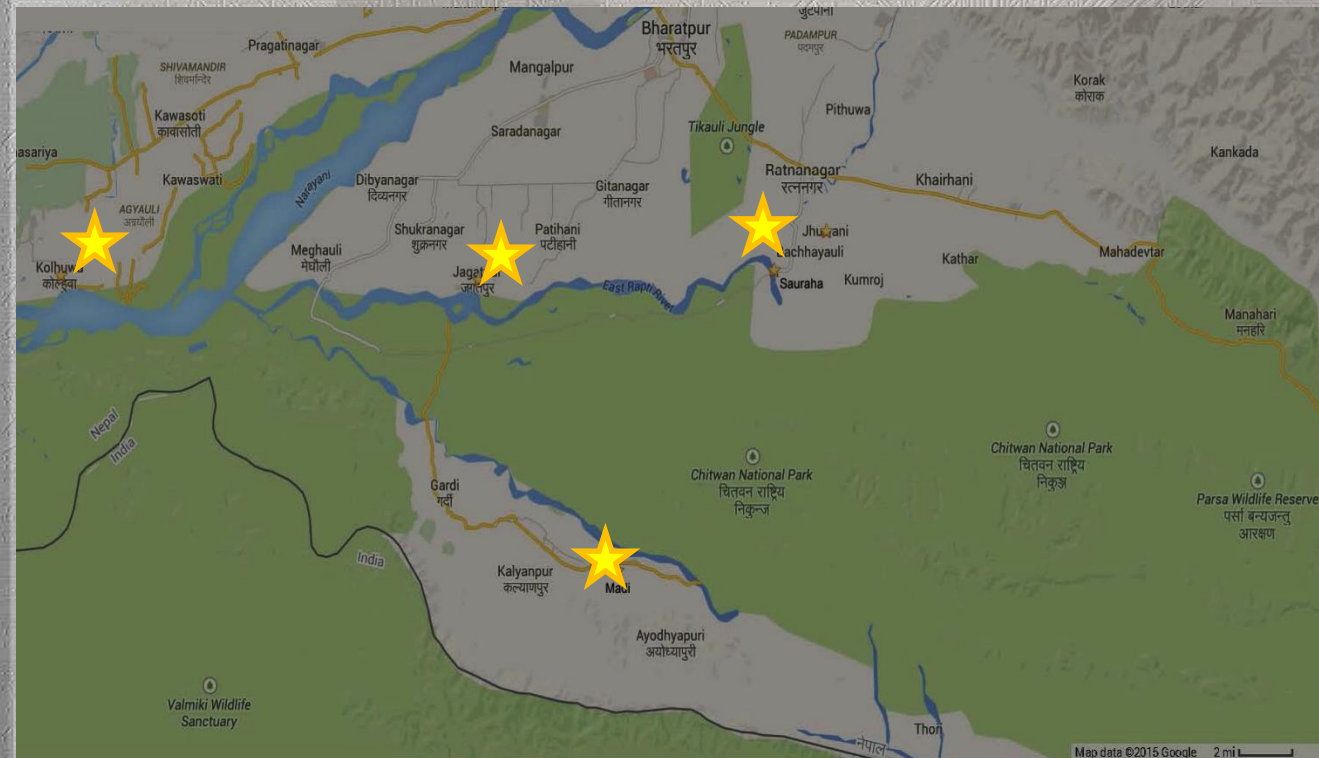
# Sero survey of CDV in rescued carnivores

- Serum Virus Neutralization Assay in collaboration with AFU (Agricultural and Forestry University), Cornell University
- Royal Bengal Tiger - 29
- Common Leopard - 24
- Sloth Bear - 2
- Snow Leopard - 3
- Jungle Cat - 1



# CDV surveillance in stay dogs

**Design:** Sample dogs in 4 selected communities in the buffer zone of CNP





- **Analysis**

- 100 serum samples
- Serum virus neutralization assay for CDV

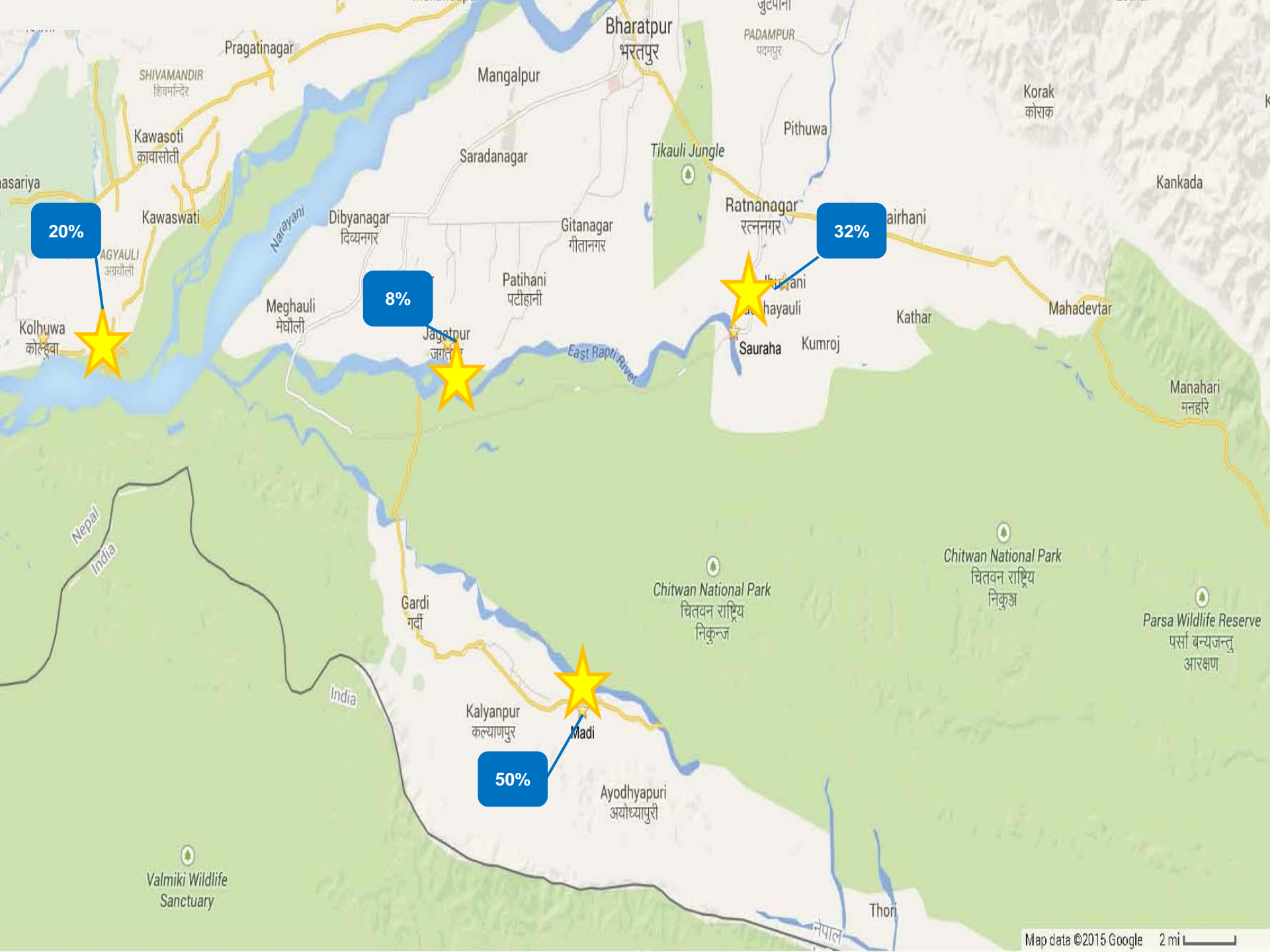




# Results

- 27% of dogs sampled POSITIVE for CDV antibody (range 8-50% in 4 sectors we selected)
- No dogs were symptomatic for disease
- No dogs had previous CDV vaccination
- 43% had previous Rabies vaccination
- Age and titer: 88% of dogs with + titer were age 3 or older
- Sex and titer: 34% of the males were positive ; 27% of the females were positive

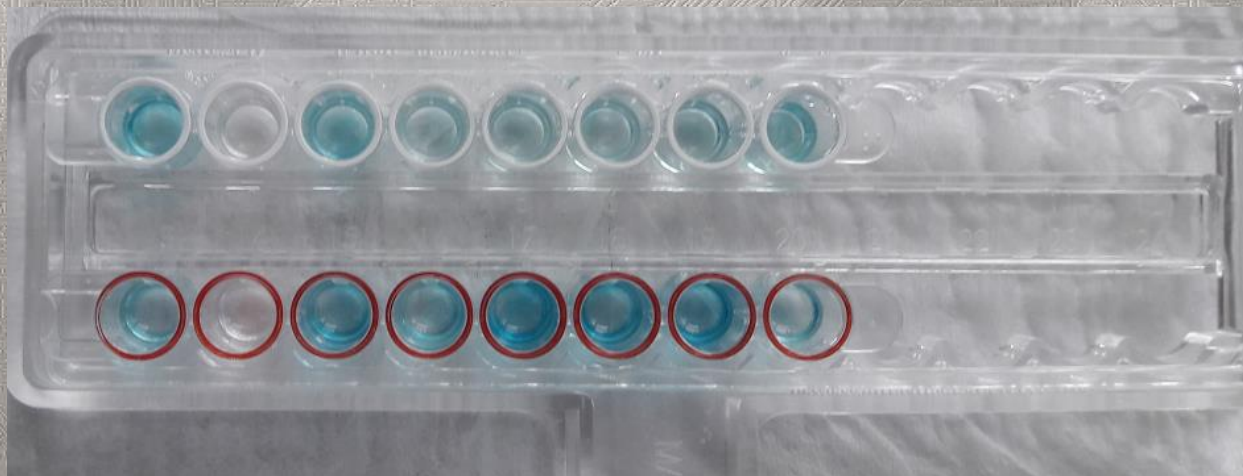




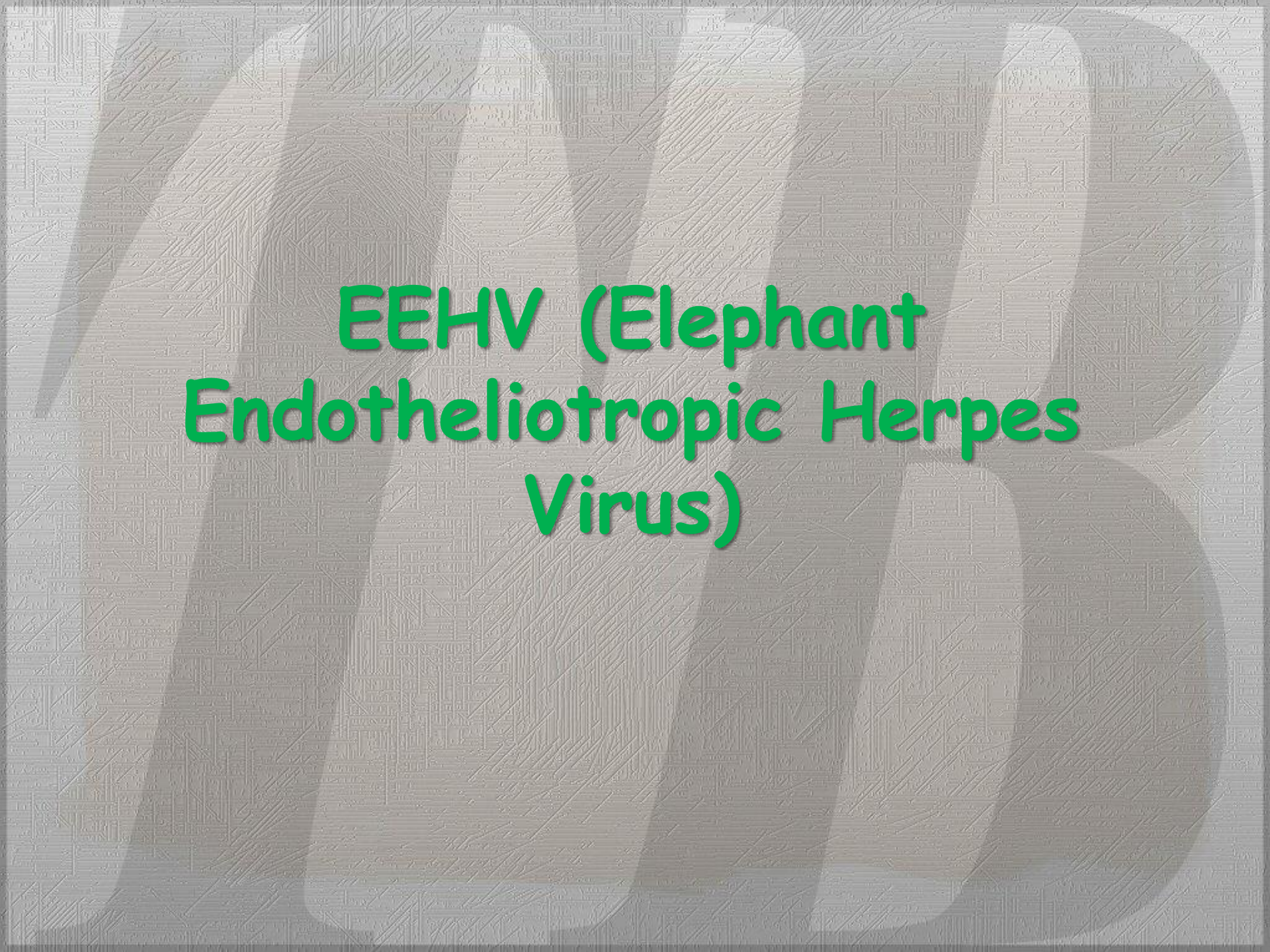


# Recent Surveillance

Sectors	Number of Animal	CDV	CPV
Madi	113	19	41
Kasara	50	13	10
Total	163	32	51







# EEHV (Elephant Endotheliotropic Herpes Virus)



# Introduction

- Biggest threats to the captive Asian elephant (*Elephas maximus*) breeding programmes worldwide.
- First diagnosed in 1995, over 90 cases with 90 % mortality.
- EEHV belongs to the subfamily Betaherpesvirinae and the newly designated genus *Proboscivirus*.
- Currently, six EEHV have been identified as EEHV-1 to EEHV-6 (Latimer and others 2011).
- EEHV-1 commonly isolated and most pathogenic (Fickel and others 2001).



Name	Sex	DOD	Age at infection	Location
Unnamed	M	09.09.2009	11 month	CNP
Narayangaj#*	M	<b>Survived</b>	2 years	SNP
Anarkali	F	11.25.2012	1.5 yrs.	CNP
Ganendra Gaj*	M	09.15.2002	1.5 yrs	CNP/NTNC
Hem gaj*	M	07.09.2015	3 yrs.	CNP/NTNC
Bhadra gaj*	M	06.19.2011	16 month	CNP/Gaida R.
Samrat Gaj#*	M	<b>Survived</b>	2 yrs	CNP/ Sapana R.
Prem prasad*	M	08.17.2016	2.5 yrs	Bardia NP
Kumar Gaj	M	<b>Survived</b>	10.5 Yrs	Bardiya NP
UN	M		3 Yrs	Bardiya NP
Ambekali	F	<b>Survived</b>		CNP
RajaGaj	M	<b>Survived</b>		CNP/NTNC
Karnali Kali	F			Bardiya NP





## Cases of Hem Gaj Died on 9 July 2015







1<sup>st</sup> Day







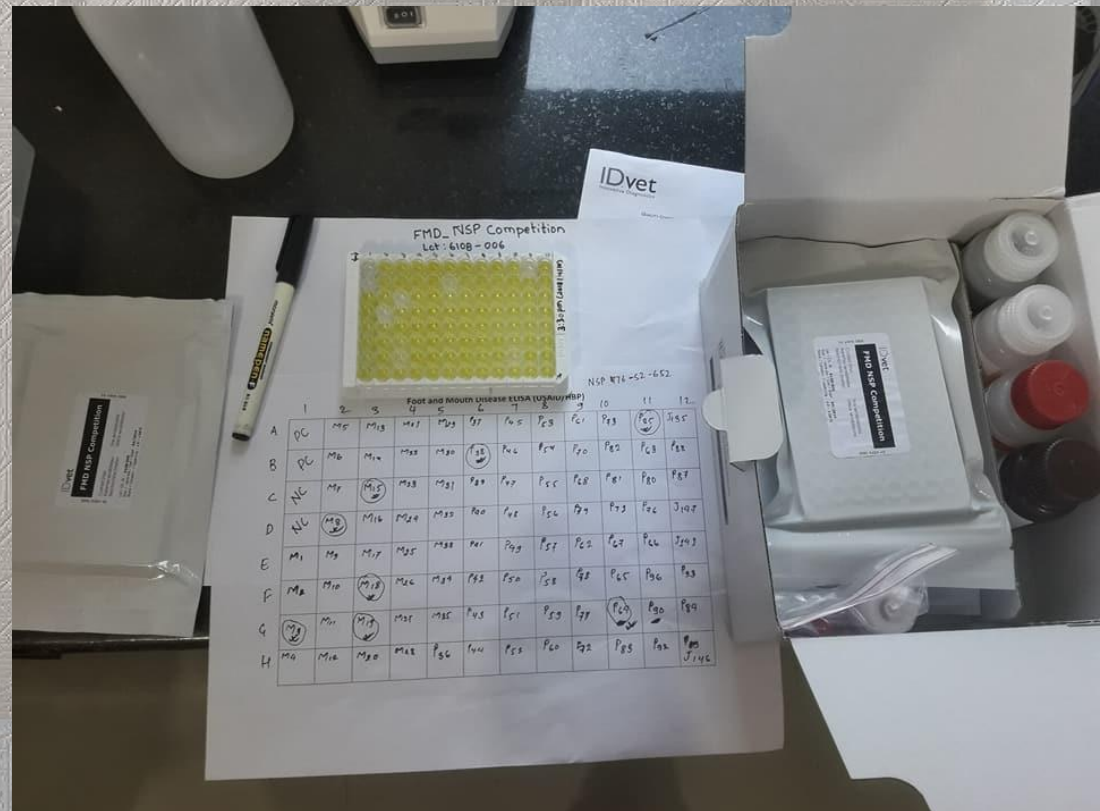
**2nd Day**





# Foot and Mouth Disease

- Livestock of buffer zone
- Madi, Jagatpur, Padampur
- Impact on Prey population





	1	2	3	4	5	6	7	8	9	10	11	12
A	0.058	0.845	0.847	0.988	1.295	0.926	1.186	0.928	1.391	1.012	0.15	1.26
B	0.045	0.953	1.186	0.962	1.191	0.133	0.859	1.05	0.809	1.287	1.203	1.068
C	1.207	0.99	0.058	0.802	1.191	0.644	0.776	0.952	0.918	0.829	1.016	0.823
D	1.041	0.045	0.806	0.956	0.976	1.011	1.178	1.145	0.713	0.963	0.856	0.923
E	0.708	0.824	1.084	1.044	1.072	0.862	0.899	0.935	0.794	0.705	0.845	0.714
F	0.787	0.914	0.452	0.862	1.055	0.801	1.14	0.959	1.032	0.631	1.07	0.921
G	0.357	0.989	0.253	1.154	1.144	0.947	1.05	0.807	0.923	0.332	1.121	0.959
H	0.966	1.023	0.934	1.004	1.037	0.935	1.179	1.04	0.998	0.987	1.027	1.093

**ELISA reading of FMD ELISA  
test**



# Tick and tick borne pathogen

- Tick collected from rescued wildlife
- Molecular study of tick species and pathogens.
- Genetic diversity of tick and tick borne pathogen
- Collaboration of Hokkaido University Japan.





Thank You