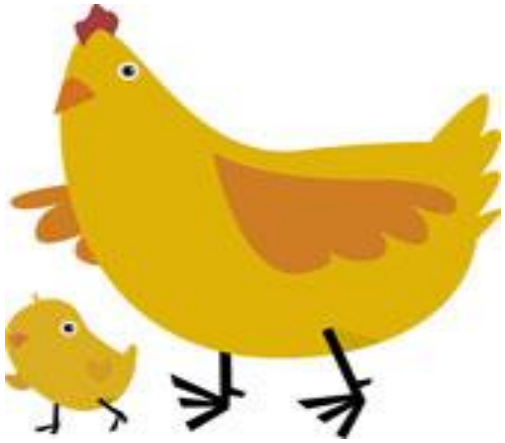
Surveillance on Avian Influenza

Indian Scenario



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India at a glance

- Country of sub-continental proportions
- Total geographical area – 3.29 million sq. kms.
- 29 States and 7 Union Territories
- 6,41,169 villages

POULTRY AT A GLANCE

- **Poultry Population : 729.2 Million**

- Poultry (fowls) – 692.64 Millions
- Duck - 23.53 Million.
- Others - 13.03 Million

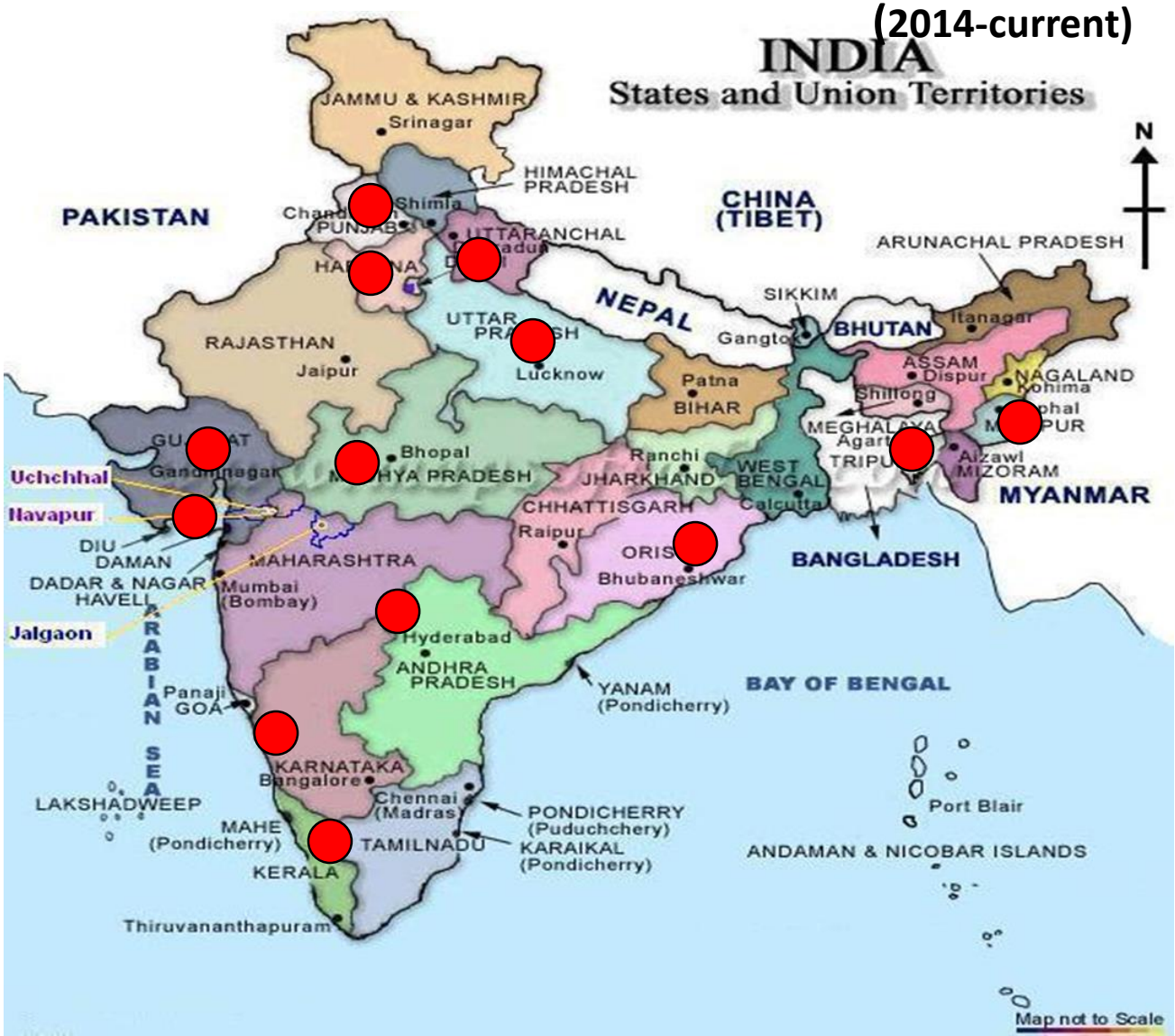
- **Total poultry comprises of;**

  - Total poultry in farms: 511.71 Million
  - Total poultry in backyard: 217.49 Million

(Source: 19th Livestock Census)

History of Avian Influenza

(2014-current)



Outbreaks of Avian Influenza in India

- First outbreak in 2006 (Maharashtra and Gujarat)
- Last outbreaks on 13.02.2017, in Odisha
- Since first outbreak to 2016, all outbreaks due to H5N1
- Virus clade has been changing
- First time, H5N8 AIV reported in October, 2016
- All outbreaks were contained successfully following guidelines of Action Plan
- birds and in zoo birds too
- Currently, the country free from AI

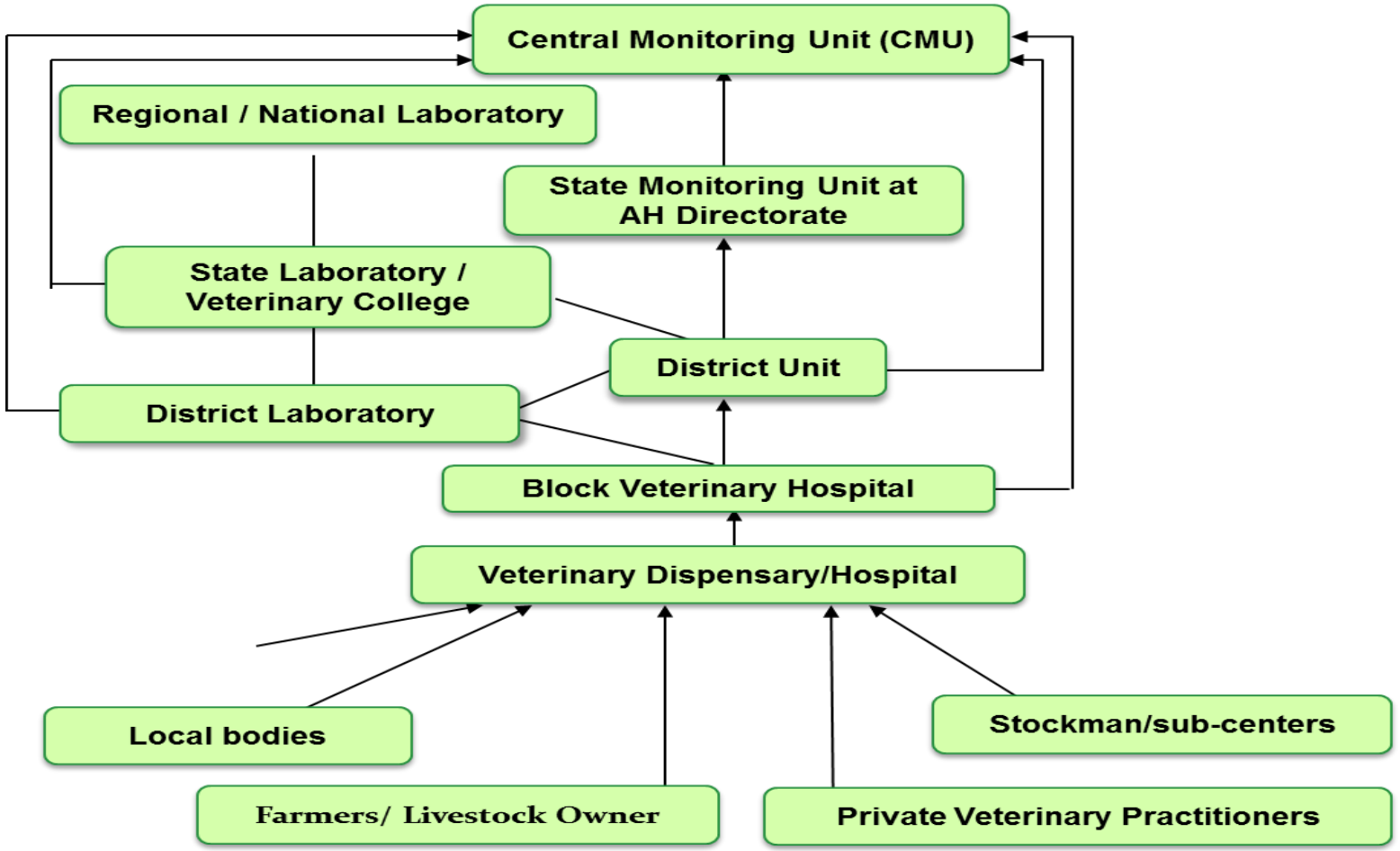
Emergence of HPAI H5N8 virus in India

- Reported in 7 states - Delhi, MP, Haryana, Punjab, Gujarat, Karnataka & Kerala
- Isolated from wild birds and poultry
- Belonged to intercontinental group B of **clade 2.3.4.4**
- Closely related with H5N8 viruses isolated from wild birds in Russian Federation and China in May 2016.

Preparedness

- National Action Plan on Avian Influenza
- Infrastructure- 256 State Disease Diagnostic labs, 23 BSL –II labs, 5 Regional Disease Diagnostic Laboratories and 1 Central Disease Diagnostic Laboratory (except 1 all BSL -III), 1 BSL-III+ lab National Institute of High Security Animal Disease, Bhopal (OIE Reference lab), 6 Animal Quarantine & Certification Services, 12,235 Veterinary hospitals/ polyclinics and 27149 Veterinary Dispensaries
- Surveillance in place
- Training- 90% Vets/paravets trained
- Web based National Animal Disease Reporting System
- Legislative support- The Prevention and Control of Infectious and Contagious Diseases in Animals Act,2009

National Animal Disease Reporting System



Disease Reporting System

- There is a well-knit infrastructure of Government Veterinary Service Units at each level for disease reporting
- In order to streamline the disease reporting system from the grass root level, Government of India has set up a computerized system of animal disease reporting - National Disease Reporting System (NADRS)
- For disease epidemiology and forecasting, ICAR-NIVEDI has developed NADRES (National Animal Disease Referral Expert System)

Surveillance Programme under implementation

- National Strategy is to contain it at its origin in animal.
- Sustained, active, focused surveillance.
- Poultry, migratory birds etc. covered.
- In the event of unusual mortality samples tested at equipped laboratory.
- Active surveillance undertaken by collecting samples (tissue, swab and serum) randomly from all parts of the country.

Surveillance for AI in Poultry in India

- Surveillance for poultry began in 2001
- Intensified since 2004
- It is rigorous since the first episode of bird-flu in 2006
- Sampling done from:
  - Domestic poultry including ducks
  - Migratory and wild birds
  - Imported Stock (under quarantine)
  - Any livestock produce containing poultry origin products

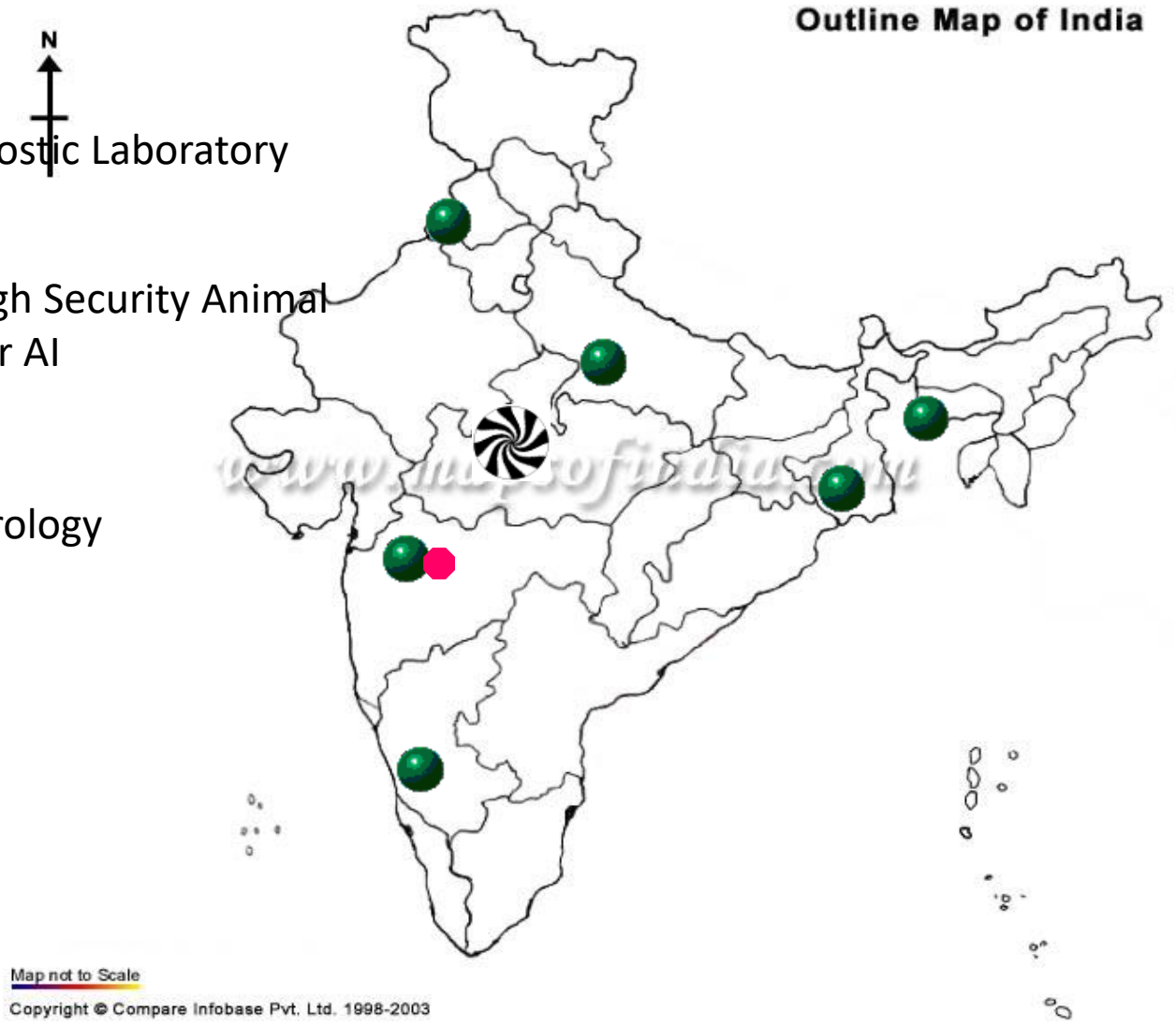
- Nature of samples
  - Morbid tissues
  - Clinical swabs (tracheal or cloacal)
  - Faecal sample
  - Blood serum

Network of AI Surveillance laboratories

Regional Disease Diagnostic Laboratory

National Institute of High Security Animal Disease ,OIE Ref. Lab for AI

National Institute of Virology

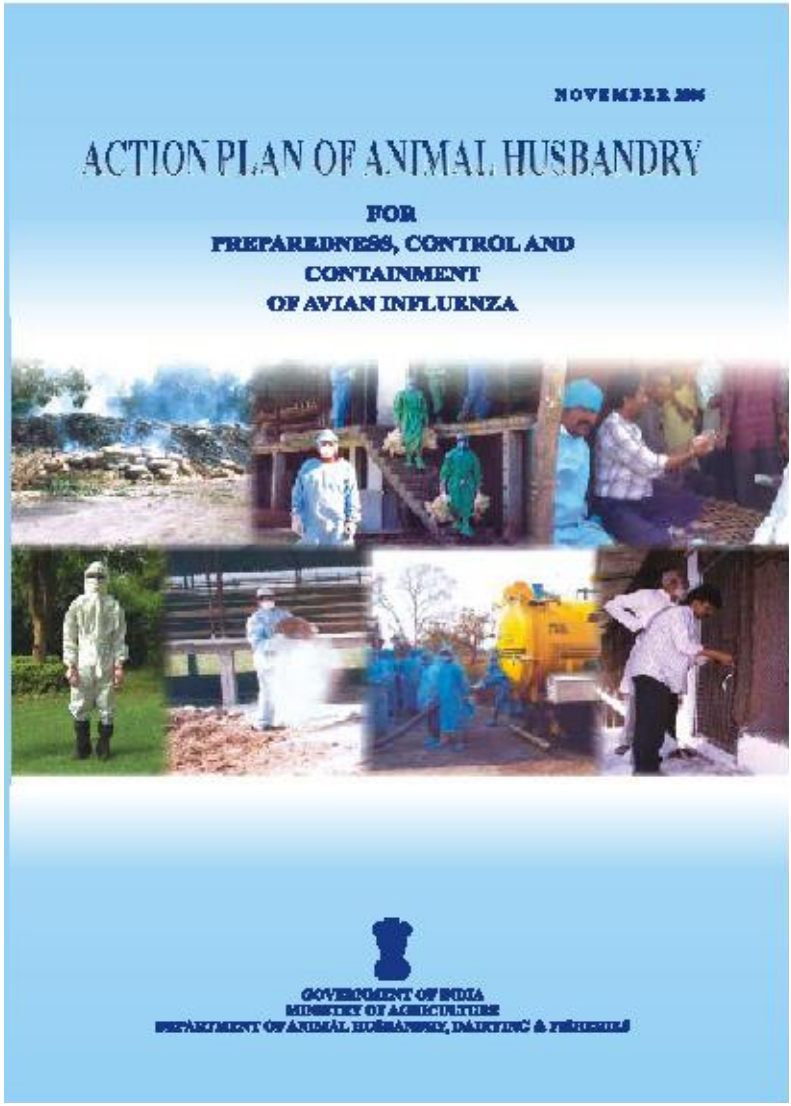


Testing Methods

- **Serological Tests**: AGID, HI, ELISA for antibody
- **Virus Isolation**: DCE, MDCK Cell Line
- **HA Sub-typing-**
- HA and HI tests (with sub-type specific serum)RT-PCR (WHO and OIE (Lee) primers)
- Real-Time PCR (TaqMan and SyBr Green assay)
- **NA sub-typing**
- **RT-PCR & Neuraminidase Inhibition Assay**
- **Gene Sequencing** for molecular epidemiology
- **IVPI test** for identifying HPNAI / LPNAI / LPAI

National Action Plan

- First release- November, 2005, much before first outbreak in India
- As per International standards and guidelines of OIE
- Action Plan revised in 2006, 2012 & in 2015 based on new experiences, the lessons learnt from past and the contemporary scientific information
- Guideline for prevention , control and containment of Avian Influenza for Zoological parks was also included in National Action Plan during 2016.
- Guidelines/ advisories for States on actions to be taken in respect of poultry as well as wild birds
- Available on department website www.dahd.nic.in under the link Animal Health-BIRD FLU (http://dahd.nic.in/about-us/divisions/livestock-health)



March, 2015

Action Plan of Animal Husbandry for Preparedness, Control and Containment of Avian Influenza

Government of India
Ministry of Agriculture
Department of Animal Husbandry, Dairying and Fisheries

Overall control and response strategies

- Control and containment of Avian Influenza includes culling of birds & mopping-up, clean-up, disinfection and sanitization operations.
- After an outbreak surveillance is stepped up immediately throughout the country.
- In addition, surveillance becomes more vigorous in 0-10 km areas from the infected site.
- Post-operation surveillance plan issued in consultation with the State Government for implementation after control operations.
- The Action Plan of Animal Husbandry is revised in 2006, 2012 & in 2015 based on new experiences, the lessons learnt from past and the contemporary scientific information.

Major strength

- Continuous strengthening of preparedness to tackle any future eventuality
- About 90% veterinary workforces in the country have been trained to handle control and containment operations.
- 44395 members of community have been trained for providing information on HPAI/ suspected HPAI to the nearest veterinary institution so as to enable an immediate response.
- Guidelines issued to the states for further guidance to the poultry farmers for strengthening biosecurity.
- Continuous monitoring and review of preparedness of the States

Lessons learned

- Multi-sectoral and Regional coordination is essential
- Depopulation is best strategy to contain the infection at source
- Timely compensation is key to success
- Early action is crucial
- IEC – highly important

Limitations

- Cultural practices & long international border
- Surveillance in wild birds, wet land areas and those of nesting places of migratory birds
- Virus mutational threat

THANK YOU