



Veterinary Epidemiological Bulletin Sri Lanka



Volume 7 No 3

ISSN - 1800- 4881

July -Sep 2014

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Haemorrhagic Septicaemia

1.1 Introduction

Haemorrhagic Septicaemia (HS) is a contagious bacterial disease characterized by an acute, highly fatal septicaemia with high morbidity and mortality. The disease is caused by certain serotypes of *Pasteurella multocida*, a gram-negative coccobacillus residing mostly as a commensal in the upper respiratory tract of animals (nasopharynx). It affects cattle and water buffaloes. Although outbreaks of Hemorrhagic septicaemia have been reported in sheep, goats and swine, it is not a frequent or significant disease. Infrequent cases have been reported in other animals like deer, camels, elephants, horses, donkeys, yak and bison. Laboratory rabbits and mice are highly susceptible to experimental infection.

Distribution

HS occurs in South and South East Asia, Middle East and most of Africa, the disease has also been reported to occur occasionally in Southern Europe. In many Asian countries disease outbreaks mostly occur during the monsoon (high humidity and high temperatures). The Asian serotype B:2 and the African serotype E:2 (Carter and Heddleston system), corresponding to 6:B and 6:E (Namioka-carter system), are mainly responsible for the disease.

Higher incidence of HS is associated with moist, humid conditions, high buffalo population density and extensive free grazing system of management, where large herds graze freely in common pastures and are paddocked together at night. In situations where occasional sporadic outbreaks occur in some regions within endemic countries, mortality may be very high unlike endemic areas where regular, seasonal outbreaks occur.

Clinical Signs

- Most cases are acute or peracute. The following signs are seen: High fever, dullness, and reluctance to move are the first signs.
- Salivation and nasal discharge develop,
- Edematous swellings become apparent in the pharyngeal region; these swellings spread to the ventral cervical region and brisket.
- Congested mucous membranes.

Respiratory distress occurs, and the animal usually collapses and dies 6 – 24 hours after the first initial clinical signs. In calves haemorrhagic gastro-enteritis also been reported.

Buffaloes are generally more susceptible to HS than cattle and show more severe forms of disease with intense clinical signs. In endemic areas most deaths are confined to older calves and young adults. In some countries, HS has been identified as a secondary complication in cattle and buffaloes following outbreaks of foot and mouth disease (FMD). Case fatality approaches 100% if treatment is not followed at the initial stage of infection.

Morbidity depends on immunity and environmental conditions, including both weather and husbandry; morbidity is higher when animals are herded closely, in poor condition, or exposed to wet conditions

Mortality is nearly 100% unless the animal is treated very early in the disease; few animals survive once they develop clinical signs.

Postmortem Lesions

Widespread haemorrhages, oedema, and hyperaemia, consistent with severe sepsis

- Swelling of the head, neck, and brisket occurs in nearly all cases or similar swellings can also be found in the musculature
- Oedema consists of a coagulated serofibrinous mass with straw-coloured or bloodstained fluid
- Subserosal petechial haemorrhages may occur throughout the body, and the thoracic and abdominal cavities often contain blood-tinged fluid
- Scattered petechiae may be visible in the tissues and lymph nodes, particularly the pharyngeal and cervical nodes; these nodes are often swollen and hemorrhagic
- Pneumonia or gastroenteritis occasionally occurs but usually is not extensive
- Atypical cases, with no throat swelling and extensive pneumonia, are sometimes seen
- There are no microscopic features that are specific for hemorrhagic septicaemia – all lesions are consistent with severe endotoxic shock and massive capillary damage

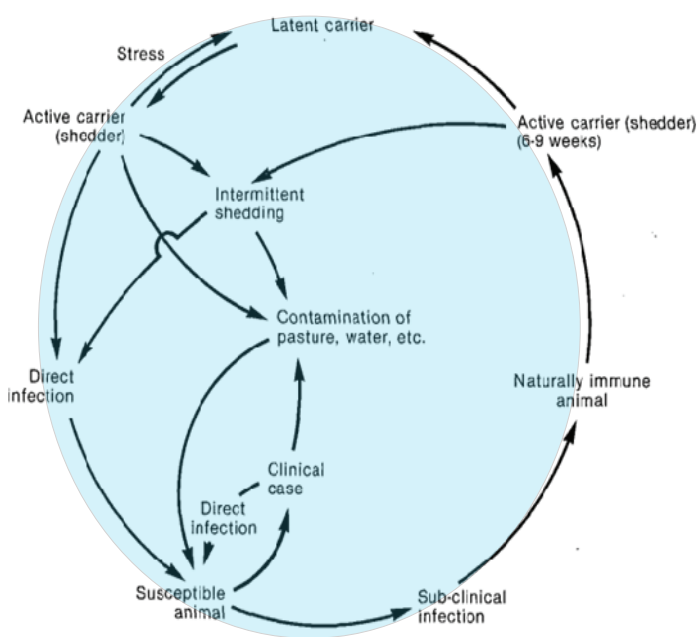
Transmission

HS is principally a disease of animals under stress. In endemic areas about 2% of healthy cattle and buffalo carry the organism in lymphatic tissue of the upper respiratory tract. Intermittently, even in the presence of circulating antibody, the organisms invade the nasopharynx and are excreted in nasal secretions. Cattle and buffalo become infected when they ingest or inhale the causative organism, which probably originates in the nasopharynx of infected animals.

The worst epidemics occur during the rainy season, in animals in poor physical condition. Stresses such as a poor food supply are thought to increase susceptibility to infection, and close herding and wet conditions seem to contribute to the spread of the disease.

Diagnosis

It is based on some characteristic epidemiologic and clinical features aid in the recognition of HS. Sporadic cases are more difficult to diagnose clinically, The season of the year, rapid course, and high herd incidence, with fever and oedematous swellings indicate typical HS. The necropsy lesions support the clinical diagnosis and confirmation requires the isolation and characterization of the pathogen using conventional and molecular techniques.



The Epidemiological Cycle in Haemorrhagic Septicaemia

Laboratory Diagnosis

The diagnosis is based on the isolation of *Pasteurella multocida*. *P. multocida* is not always found in blood samples before the terminal stage of the disease, and is not consistently present in nasal secretions or body fluids of sick animals

Samples

- In freshly dead animals, a heparinised blood sample or swab should be collected from the heart within few hours of death.
- A long bone should be taken from animals that have been dead for a long time
- Other visceral organs may also be sampled If a necropsy is not feasible, blood samples can be taken from the jugular vein by aspiration or incision; blood samples should be placed in a standard transport medium and transported on ice packs
- Bone marrow provide excellent sample for the laboratory, as these are contaminated relatively late in the post-mortem process by other bacteria

Differential diagnosis

- Shipping fever is often mistakenly confused for HS, but has a multifactorial aetiology (often Mannheimia haemolytica), is not septicaemic, and does not cause multisystemic petechial haemorrhages
- The peracute nature of the disease and the extensive oedema and haemorrhage make it difficult to differentiate from blackleg and anthrax
- Acute salmonellosis, mycoplasmosis, and pneumonic pasteurellosis should also be considered

Medical prophylaxis

Antibiotic treatment is effective if it is started very early, during the pyrexia stage. Antimicrobial susceptibility testing (ABST) is particularly necessary for *P. multocida* for which resistance to commonly used antimicrobial agents has occurred. The following agents have proven their clinical efficacy: penicillin, amoxicillin (or ampicillin), cephalothin, ceftiofur, cefquinome, streptomycin, gentamicin, spectinomycin, florfenicol, tetracycline, sulfonamides, trimethoprim/sulfamethoxazole, erythromycin, tilmicosin, enrofloxacin or other fluoroquinolones), Amikacin and norfloxacin

Control / vaccines

Vaccination is routinely practiced in endemic areas. Three preparations are used – dense bacterins combined with either alum adjuvant or oil adjuvant, and formalin-inactivated bacterins; the oil adjuvant bacterin is thought to provide protection for up to one year and the alum bacterin for 4–6 months. In endemically infected areas, annual immunisation using adjuvant vaccines gives good control.

Measures during an outbreak

Vaccination is a major control measure in the face of a new epidemic. Various vaccine types have been developed among which broth bacterin, or oil adjuvant vaccines are recommended; Sanitary measures include early detection and isolation of new cases and their immediate treatment with antibiotics, deep burial of carcasses or incineration, and the prevention of movements of animals to disease free areas.

2. Status of Livestock Diseases

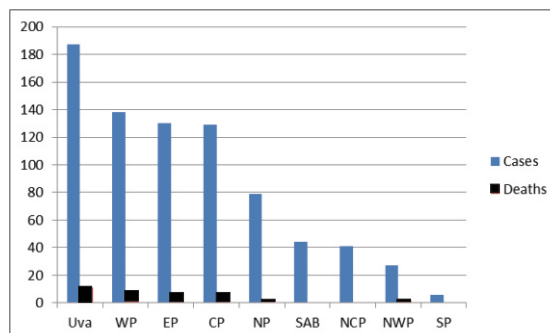
2.1 Bovine Diseases

2.1.1 Bovine Babesiosis

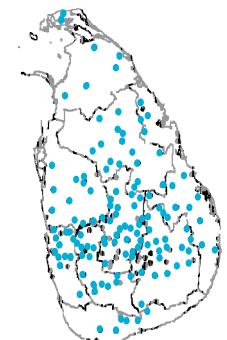
A total of 781 cases of Bovine babesiosis have been reported with a Case Fatality Rate (CFR) 5%, during the third quarter, 2014. The total no. of pre-immunization was 515. Calves in the age group between 4-18 months are pre-immunized against both *Babesia bovis* and *Babesia bigemina*. The calf pre-immunized should be intensively and semi-intensively managed to avoid exposure to Ticks after the immunization.

Province	Cases	Deaths
Uva	187	11
WP	138	8
EP	130	7
CP	129	7
NP	79	2
SAB	44	0
NCP	41	0
NWP	27	2
SP	6	0
Total	781	37

Provincial Distribution Third Quarter 2014



Spatial Distribution Third Quarter 2014

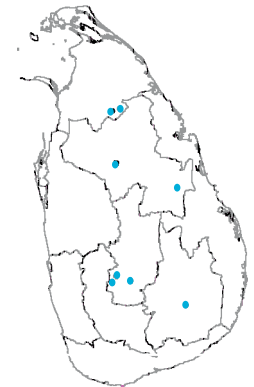


2.1.2 Bovine Brucellosis :

In the third quarter of 2014, a total of 29 clinically suspected Brucellosis cases have been reported. As a control measure 140 pooled milk samples were subjected to MRT at milk collecting centers in Brucellosis endemic areas. Subsequently, 222 cows were tested by RBPT, tracing the positive herds. 1754 heifers have been immunized against Brucellosis during the period of review .

District	Cases
Nuwaraeliya	3
Kandy	1
Trincomalee	9
Anuradapura	2
Polonnaruwa	1
Mannar	4
Vavuniya	7
Monaragala	2
Total	29

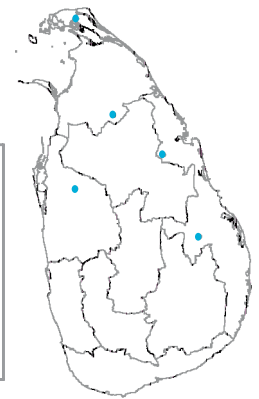
Spatial Distribution Third Quarter 2014



2.1.3. Black Quarter

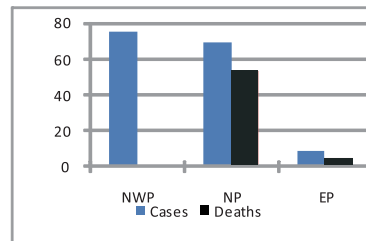
There were 153 cases of Black Quarter (BQ) reported during the third quarter 2014. A total of 42,283 prophylactic vaccinations were carried out in 52 Veterinary Ranges where BQ is endemic.

Spatial Distribution Third Quarter 2014



Black Quarter Cases & Deaths Third Quarter –2014

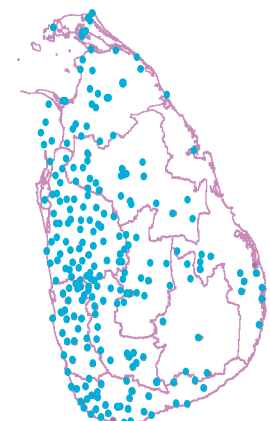
Month	Cases	Deaths	Province	Cases	Deaths
July	96	10	NWP	75	0
Aug	36	33	NP	69	53
Sept	21	15	EP	9	5
Total	153	58	Total	153	58



2.1.4 Foot and Mouth Disease

By the end of the third quarter, 2014, it has reported 12673 Cases of FMD with 307 deaths, Outbreaks are reported from 212 Veterinary Ranges, from Kayts in Jaffna District to Kekanadura in Matara District during the period of review. By the end of September, Animal Health Division confirmed the current FMD episode causative agent as a new strain (*Ind-2001d*) within the same toptype of serotype ‘O’ (a new sub-lineage within the same genetic lineage). Samples were collected throughout years, 2013 and 2014 dispatched to the World Reference Laboratory for FMD (WRL-FMD), Pirbright, UK, and confirmed them as a new strain.

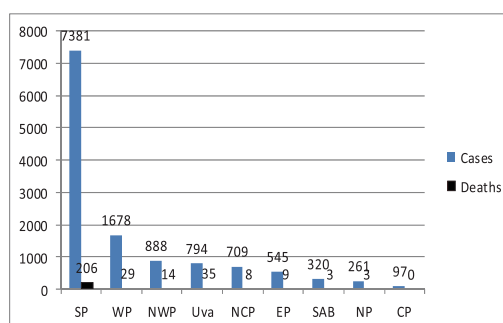
Spatial Distribution of Foot & Mouth Disease



Monthly Distribution Third Quarter 2014

Month	Cases	Deaths
July	6969	182
Aug	2334	72
Sept	3370	53
Total	12673	307

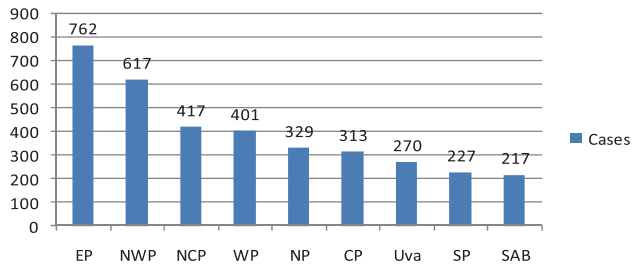
Provincial Distribution Third Quarter 2014



2.1.5 Mastitis

In the third quarter, 2014, a total of 3553 mastitis incidences and 7 fatalities have been reported. 150 lit of CMT, reagent, 620 lit of Teat dip solution, 2182 udder base vials have been issued to the field and 592 ABST were carried out in order to control mastitis.

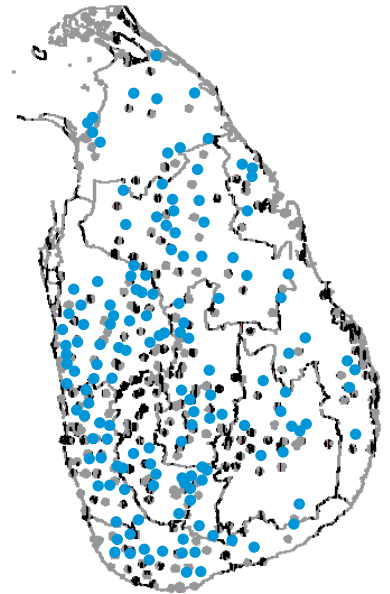
Cases



Provincial Distribution of Mastitis Cases and Deaths

Province	Cases	Deaths
EP	762	1
NWP	617	1
NCP	417	2
WP	401	2
NP	329	0
CP	313	0
Uva	270	0
SP	227	0
SAB	217	1
Total	3553	7

Spatial Distribution 3rd Quarter 2014



Monthly Distribution Third Quarter 2014

Month	Cases	Deaths
July	1267	2
Aug	1104	2
Sept	1182	3
Total	3553	7

2.2 Caprine Diseases

2.2.1 Contagious Pustular Dermatitis :

During the third quarter 2014, reported 403 cases of Contagious Pustular Dermatitis with 4 deaths.

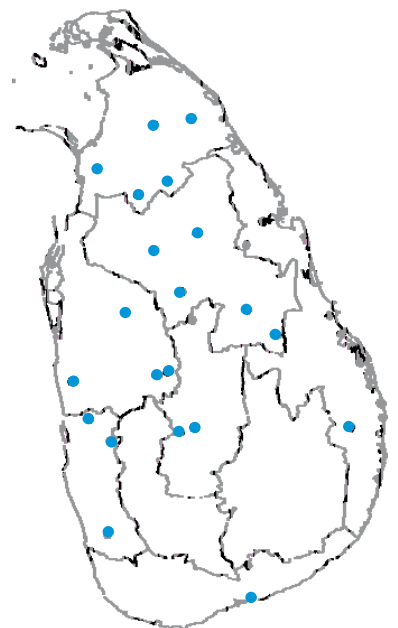
Provincial Distribution Third Quarter 2014

Province	Cases	Deaths
CP	34	0
EP	71	0
NCP	114	0
NWP	48	0
NP	122	03
SP	7	0
WP	7	1
Total	403	04

Monthly Distribution Third Quarter 2014

Month	Cases	Deaths
July	126	2
Aug	126	2
Sep	151	0
Total	403	4

Occurrence of CPD in the Third Quarter 2014



2.3 Rabies :

During the third quarter, 2014 , it has been reported 24 bovine rabies and 16 canine rabies incidences.

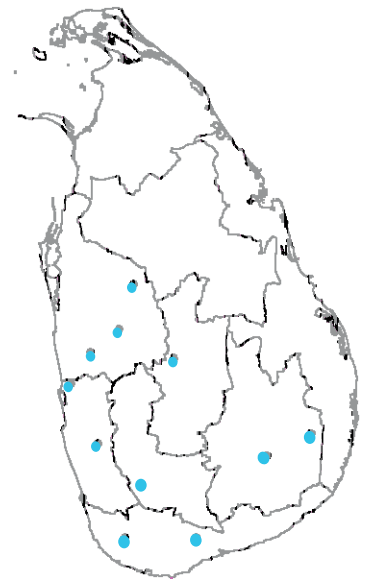
World Rabies Day , September 28, 2014 was commemorated Island wide with various events. “Together Against Rabies” Symposium was organized in collaboration with the Sri Lanka Veterinary Association and OIE by DAPH. Sterilizations & Vaccination campaigns and school awareness programs were carried out island wide.

Provincial Distribution Third Quarter 2014

Province	Cases	Deaths
Central	3	3
Eastern	3	3
North Central	10	10
North western	7	7
Southern	2	2
Uva	5	5
Western	10	10
Total	40	40

Month	Cases
July	14
Aug	17
Sept	9
Total	40

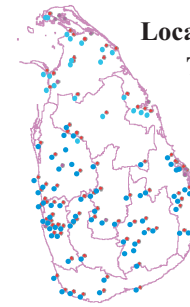
Location of Rabies Cases Third Quarter 2014



2.4 Poultry Diseases

2.4.1 Fowl Pox :

Fowl Pox is reported from 203 VS ranges in 2014. Estimated poultry population is 16,260,000 in Sri Lanka. This disease can be easily prevented by vaccination. However, vaccination coverage appears to be very low and clinical cases are found very often in the country. In year 2014 ,12309 cases were found and 634 deaths were reported.

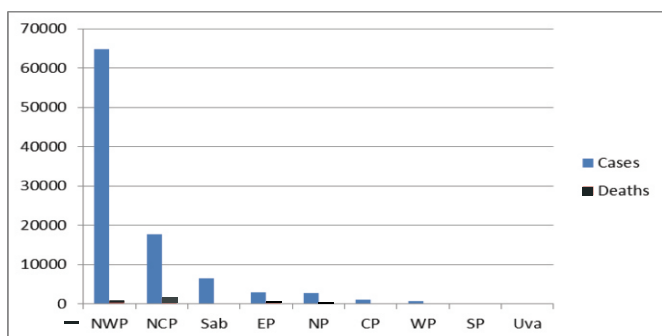


Location of Fowl Pox Cases Third Quarter 2014

2.4.2 Gumboro Disease :

The third quarter 2014 has reported 96,771 cases and 3479 deaths of Gumboro . Estimated poultry population is 16.26 Million. Gumboro period prevalence was 37220 per 100,000 birds. Higher incidences are reported from densely poultry populated area, in North Western Province.

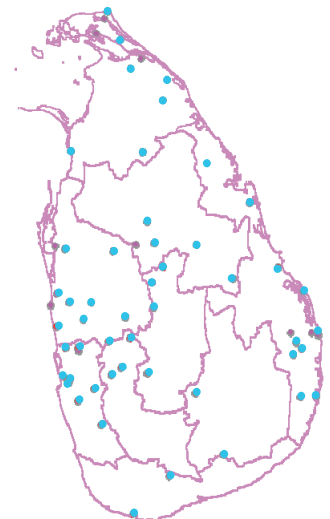
Provincial Distribution Third Quarter 2014



Monthly Distribution Third Quarter 2014

Month	Cases	Deaths
July	38593	934
Aug	24986	574
Sept	33192	1971
Total	96771	3479

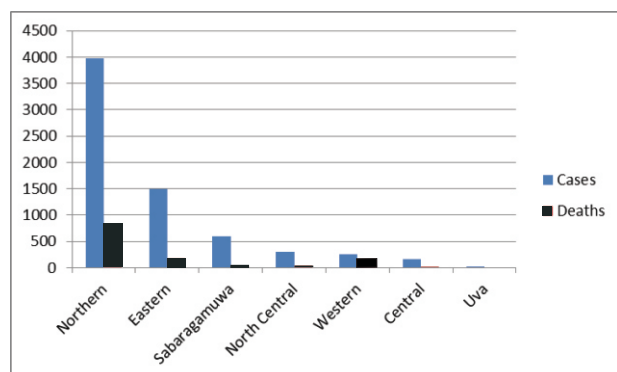
Location of Gumboro Cases Third Quarter 2014



2.4.3 Newcastle disease :-

A total of 6785 Incidences and 1227 deaths were reported in the 3rd quarter 2014.

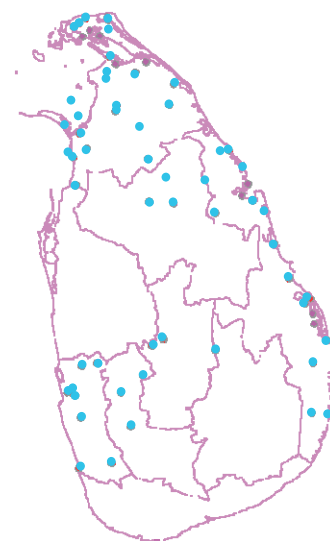
Provincial Distribution Third Quarter 2014



Monthly Distribution Third Quarter 2014

Month	Cases	Deaths
July	2783	282
Aug	1837	473
Sept	2165	472
Total	6785	1227

Spatial Distribution Third Quarter 2014



2.5 Swine Diseases

2.5.1 Porcine Reproductive and Respiratory Syndrome :

Porcine Reproductive and Respiratory Syndrome (PRRS) Causes reproductive failure of sows and respiratory problems of piglets and growing pigs. It is a viral disease causing production losses in swine industry. The 3rd quarter of 2014, 22 incidences and 02 deaths were reported. Diseases diagnostic facility has been established at Virology laboratory at Polgolla, VRI.

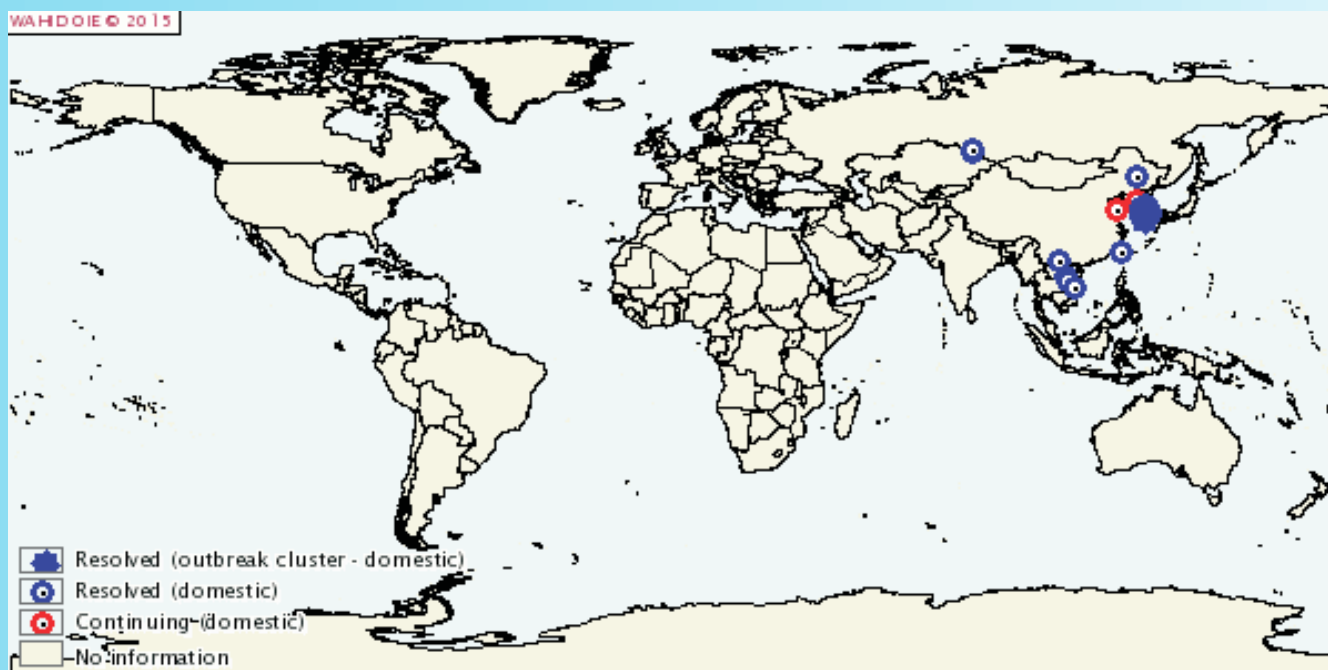
3. Highly Pathogenic Avian Influenza

3. 1 National HPAI Surveillance Program July-Sept 2014

Se. No.	District	Commercial Poultry Serum Samples		Pooled dropping and cloacal swabs	
		No. Tested	Results	No. tested for AIV *	Results
1	Anuradhapura	30	Negative	-	-
2	Badulla	15	Negative	35	Negative
3	Chilaw	60	Negative	300	Negative
4	Homagama	65	Negative	07	Negative
5	Jaffna	30	Negative	-	-
6	Kalutara	15	Negative	09	Negative
7	Kundasale	180	Negative	-	-
8	Pannala	250	Negative	-	-
9	Polonnaruwa	40	Negative	15	Negative
10	Trincomalee	45	Negative	-	-
11	Vavuniya	30	Negative	55	Negative
12	Welisara	180	Negative	115	Negative
		940		536	

* Avian Influenza Virus

3.2 Global distribution of Notifiable Avian Influenza: July-sept 2014



3.3 Global situation HPAI outbreaks Third Quarter 2014

Virus	Country
H5N1	Russia
H5N8	Korea (Rep.of)
H5N6	China (Peoples Rep of), Vietnam

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