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Department of Animal Production and Health, P.O. Box 13, Peradeniya, Sri Lanka.

Email:editorvebsl@yahoo.com

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Leptospirosis in Cattle

1.1 Introduction

Leptospirosis is a zoonotic disease caused by spirochetes belonging to different pathogenic species of genus *Leptospira*. It is recognized as re-emerging infectious disease among animals. These *Leptospira* are maintained in nature in the kidneys of certain animal species and most of these animal species act as carriers or vectors for the disease. The organism can survive in contaminated fresh water sources and muddy environment for many weeks.

The leptospire is thin, coiled gram negative, motile organism. *Leptospira* are antigenically complex and there are more than 200 known pathogenic serovar that have been classified into 25 serogroups. Certain serovar are preferred for particular animal host species also called as maintenance host and replicate in the renal tubules of these animals asymptotically. Then these animals become reservoir for the *Leptospira*. Maintenance host can be cattle, pig, dog, rodents or horses.

1.2 Transmission of Leptospire

Leptospira are transmitted directly between animals or indirectly through the environment. Livestock pick up the infection by contact with pasture or water contaminated with urine of infected livestock or wild animals. The infected organism may survive in the environment for several weeks in warm and moist conditions.

Leptospira enter to body through abrasions in the skin or nasal, oral or eye mucous membranes. Ingestion of contaminated water or food also leads for the infection. Then the organism enters in to the blood and invades all tissues and organs of the body.

Animals that are chronic carriers may continue to shed the organism. These chronic infections may be localized in the kidneys or genital tract of the animals without any detectable symptoms.

1.3 Clinical signs and symptoms

Clinical signs depend on the resistance or immunity of the herd, infecting serovar and the age of the animal infected.

Cattle can be infected at any age including young calves. They are the maintenance host for, *Leptospira hardjo*. Since this is specific for cattle, the infection is less severe. But they act as carriers and associated with long term urinary shedding. In addition infection with *Leptospira hardjo-bovis* can persist in the reproductive tract and lead to infertility problems which are the most economically damaging aspect of Leptospirosis.

If the cattle infected with other Lepto serovars (non-host adapted) such as *Leptospira Pomona*, *Leptospira icterohaemorrhagiae*, *Leptospira canicola* and *Leptospira grippotyphosa* the clinical signs are very different and more severe. When a calf is infected with non-host adapted Lepto serovar, the result is high fever, anemia, red urine, jaundice and sometimes death in three to five days. In older animals mild fever and lethargy may be unnoticed. Lactating cows produce less milk and it becomes thick and yellow within one or two weeks. Infection during pregnancy will cause embryonic death, abortion, stillbirth, retained placenta and weak calves.

1.4 Diagnosis of Leptospirosis

The sudden appearance of high fever and redwater urine in calves and adults may be sufficient for strong suspicion of *Leptospira* infection.

Laboratory examination of urine of suspected animals may be made to confirm the disease. *Leptospira* organism can be directly detected through cultures, inoculation of experimental animals, PCR and dark field microscopy.

1.5 Indirect detection of Leptospire

Serology is more effective in diagnosis of *Leptospira*. ELISA, Macroscopic slide agglutination test, Microcapsule agglutination test and indirect hemagglutination test are some of the tests widely used as screening tests.

Microscopic agglutination test is the gold standard for diagnosis of Leptospirosis in animals and humans.

1.6 Prevention and control of leptospirosis

Treatment of infected cattle with suitable antibiotics like Oxytetracycline, Tilmicosin, and Ceftiofur is important to cure the animals and also eliminate persistent infection. Infected animals should be separated from others to prevent the transmission of disease.

Preventive measures should be based on the epidemiological factors and risk factors. Prevention of exposure to contaminated water, food or soil is important in controlling the disease. Contamination of water or soil can be minimized by controlling rodent population.

In addition, preventive measures include the vaccination of animals against Leptospirosis which will give resistance to infection.

1.7 Public Health importance

Leptospirosis is a zoonotic disease. Many animal species act as carriers or vectors and they excrete the organism into the environment with their urine. Once a person contact with contaminated environment and get the infection, develop various complications due to involvement of multiple organ systems. The case fatality rate could be about 40%.

Leptospirosis is reported throughout the year in Sri Lanka. Human outbreaks show seasonal variability. There are two peaks in the disease incidence annually at the time of monsoons. Sri Lanka is considered as high risk country according to the incidence rate. Colombo, Gampaha, Kurunegala, Kegalle, Ratnapura and Anuradhapura Districts are recognized as worst affected Districts in the country .

Reported by : Dr. M. Kodithuwakku

2. Status of Livestock Diseases

2.1 Bovine Diseases

2.1.1 Bovine Babesiosis

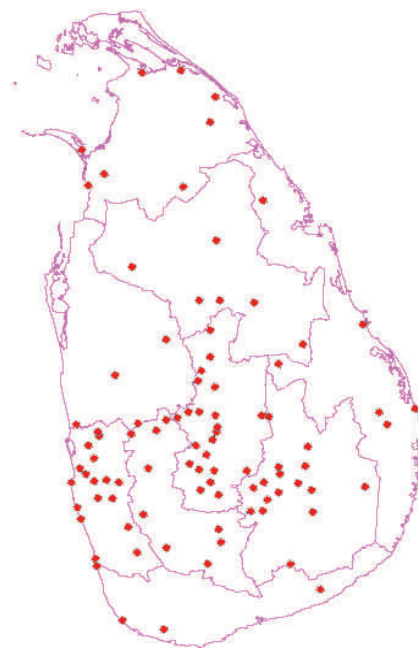
A total of 765 cases and 23 deaths have been reported due to Bovine Babesiosis during the last quarter of 2013. Total of 417 number of pre-immunizations were carried out during that period. The prevalence and mortality has increased in the year 2013, in comparison with the year 2012 as indicated below.

Prevalence of Bovine Babesiosis

	2013	2012
Cases	2945	2336
Deaths	155	97

October-December 2013

Province	Cases	Deaths
Western	196	3
Eastern	159	0
Uva	130	12
Central	114	1
Northern	57	0
Sabaragamuwa	54	2
North Central	31	1
North western	16	4
Southern	8	0
Total	765	23



2.1.2 Bovine Brucellosis :

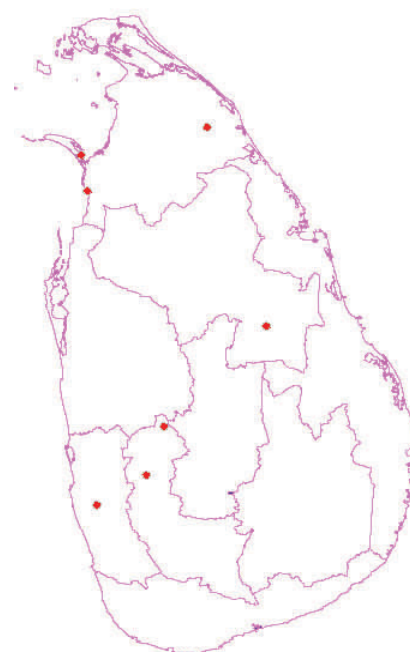
In the last quarter of 2013, a total of 33 cases of Brucellosis has been reported at Kinniya, Polonnaruwa, Oddusuddan, Vavuniya south, Musali, Mannar, Yatiyantota, Rambukkana and Homagama Veterinary ranges.

Further, the number of clinical cases and also positive animals detected in screening programs has increased in year 2013 than in year 2012.

The surveillance program implemented, Prevalence of the diseases indicates high, as indicated by number of testing done by RBPT and MRT. In the mean time there may be actual increase in prevalence of the disease in spite of vaccination perhaps due to movement of infected animals.

Bovine Brucellosis Prevalence and Control Measures

Year	2013	2012
Vaccination (S-19)	5932	6129
RBPT	914	754
MRT	1632	1450
Cases	376	181
Deaths	15	2



2.1.3. Black Quarter

There were only 3 fatal cases of Black Quarter (BQ) reported in the last quarter. A total of 174643 prophylactic vaccinations were carried out during the year covering areas where BQ is endemic. In the year 2013, in comparison to the 2012, the incidence rate is more or less the same.

Black Quarter Prevalence and Control Measures

	2013	2012
Cases	25	31
Vaccination	174643	175,522

Vaccination for Black Quarter

District	2013	2012
Anuradhapura	31511	38213
Puttlam	25686	23536
Kurunegala	25459	35626
Ampara	17262	12892
Vavuniya	15402	11323
Batticaloa	14618	11221
Mannar	13941	3565
Trincomalee	10011	4133
Mullaitivu	6741	12484
Badulla	5443	5377
Kilinochchi	4805	2654
Jaffna	4342	2251
Polonnaruwa	2371	5051
Hambantota	1863	7196
Matale	475	-
Ratnapura	170	-
Total	180100	175522

2.1.4 Foot and Mouth Disease

Foot and Mouth disease was detected in Jaffna district during the month of December 2013. The index case was found in the livestock farm at Palaly Army Camp in Tellipalai Veterinary Range where not only cattle but also goats were affected by the disease. Subsequently the infection leaked out from this farm and cases were noticed in the neighborhood. Further, it spread to two more Veterinary ranges namely Kopay and Vaddukoddai. A total of 347 cases were detected in the month of December in Jaffna district and two deaths were encountered in Kopay Veterinary range. The laboratory investigation revealed the presence of FMD sero type 'O' as the causative agent of the outbreak. FMD Vaccines (35,500 doses) were sent to Jaffna District in December 2013.

FMD Reported Ranges in Jaffna District



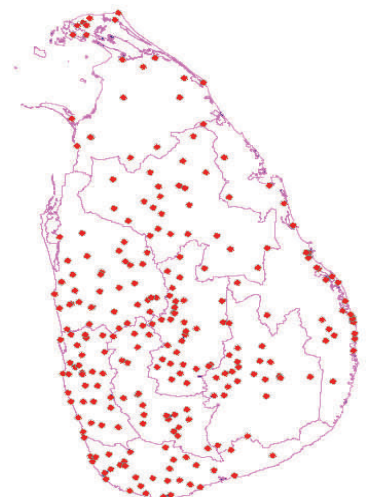
2.1.5 Mastitis :

In the last quarter, 2013, a total of 3327 mastitis cases were reported in the country. In total, year 2013 reported 12904 cases, in comparison year 2012 reported 11264 cases.

In the year 2013, the Department of Animal Production and Health produced 5135 intra mammary infusions for treatment of mastitis and they were used through the Government Veterinary Surgeons. Since these are given free of charge, it relieved the dairy farmers from the burden of drug cost in treating the dairy cows.

Prevalence of mastitis in the Fourth Quarter 2013

Month	Cases	Deaths
October	1110	3
November	1140	9
December	1077	4
Total	3327	16



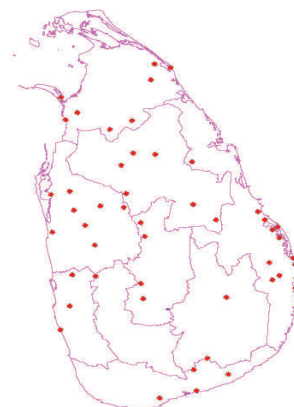
2.2 Caprine Diseases

2.2.1 Contagious Pustular Dermatitis :

During the last quarter 2013, 640 cases and 10 deaths of Contagious Pustular Dermatitis has been recorded in the country. They are reported in Kandy, Matale, Nuwara-Eliya, Ampara, Batticaloa, Trincomalee, Polonnaruwa, Anuradhapura, Kurunegala, Puttalam, Mullaitivu, Vavuniya, Mannar, Kegalle, Hambantota, Moneragala, Gampaha, and Kalutara Districts Veterinary ranges.

CPD Prevalence

	2013	2012
Cases	2061	1618
Deaths	38	39

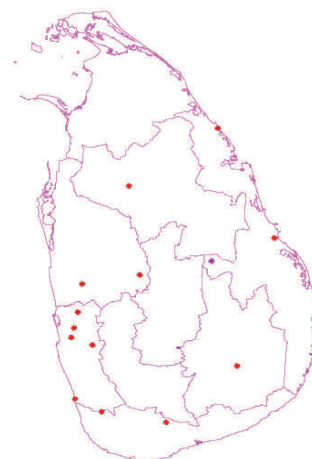


2.3 Rabies :

In the last quarter of year 2013, 22 cases of Bovine Rabies cases have been reported. Sri Lanka has been donated with 300,400 doses of Dog Anti Rabies Vaccines in July 2013 by OIE and subsequently a mass dog rabies Vaccination program has been implemented by Department of Animal Production & Health. A total of 51,984 anti rabies vaccination was carried out during the months of November and December; the programme continued to the following year too.

Rabies Prevalence in the Fourth Quarter - 2013

Species	Cases
Bovine	22
Caprine	4
Canine	5
Total	31



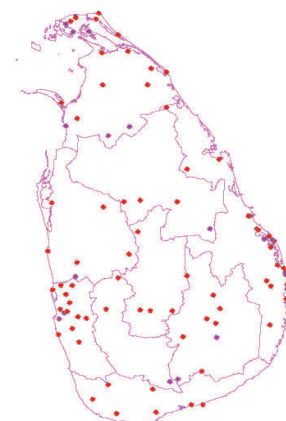
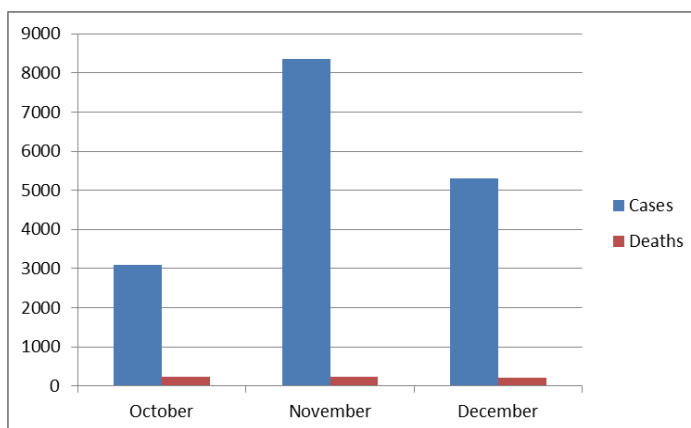
2.4 Poultry Diseases

2.4.1 Fowl Pox :

Fowl Pox has been reported from all over the country and higher incidences have been reported from Northern, Eastern, North Western and Uva Provinces. Comparison with year 2012 there has been reduction in cases from 880 to 283, per 100,000 birds and reduction in deaths from 21 to 13 per 100,000 birds in year 2013, due to improved disease control activities.

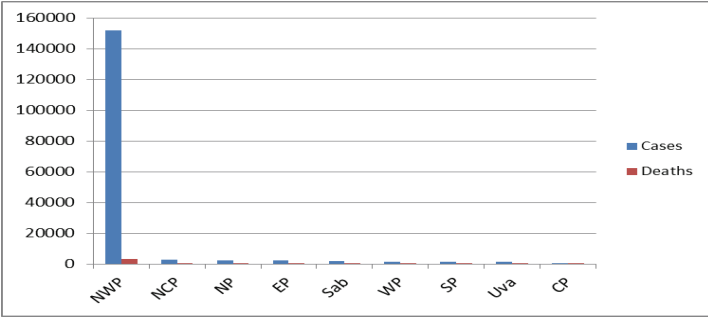
Fowl Pox Prevalence in Fourth Quarter 2013

Province	Cases	Deaths
Central	224	20
Eastern	3324	234
North Central	420	5
North western	3352	9
Northern	5381	315
Sabaragamuwa	207	1
Southern	157	10
Uva	2139	65
Western	1541	22
Total	16745	681



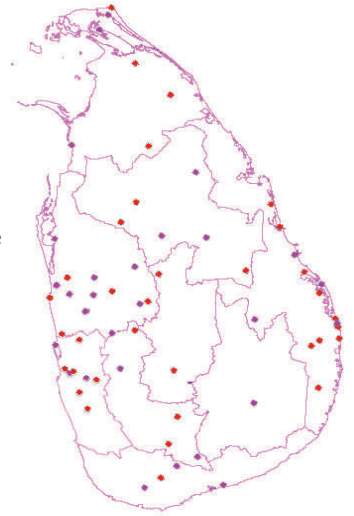
2.4.2 Gumboro disease:

In the last quarter, 2013 there has been 165,699 cases and 4693 deaths due to Gumboro disease recorded in the country. Higher incidences have been reported from densely poultry populated areas; Kurunegala, Puttlam, Anuradhapura, Polonnaruwa, Ampara, Batticaloa, Jaffna, Mullaitivu, Vavuniya, Kegalle, Ratnapura, Colombo and Gampaha districts. However, there was marked reduction in both cases and deaths (40 % and 43%) in 2013 when compared to the incidence in year 2012.



Prevalence of Gumboro disease in the final Quarter 2013

Month	Cases	Deaths
Oct	98212	1307
Nov	34182	1844
Dec	33305	1542
Total	165699	4693

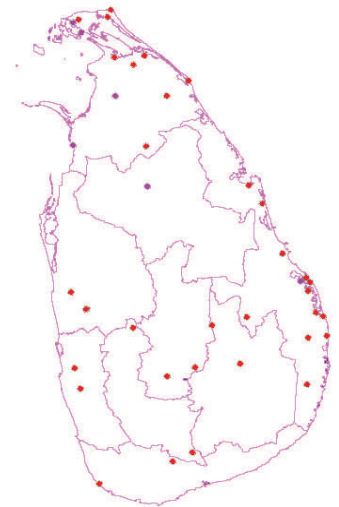
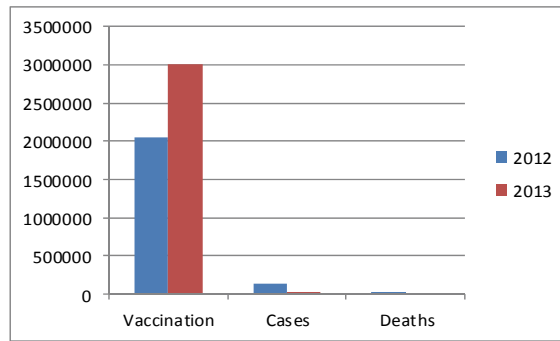
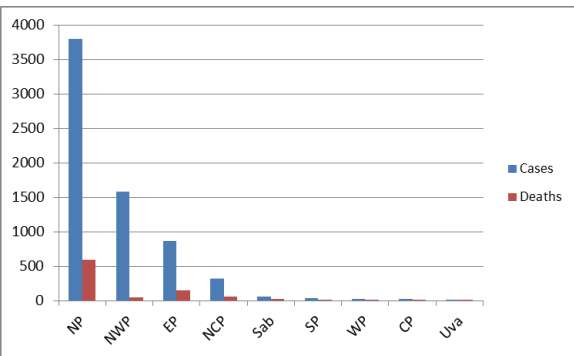


2.4.3 Newcastle disease :-

A total of 6700 Incidences and 901 deaths are reported in the last quarter 2013. As per the available Estimation, Poultry population in Sri Lanka is 15.72 million.

Vaccination coverage by Department of Animal Production and Health has increased from 7% to 10% from 2012 to 2013 and the incidence rate has been remarkably reduced from 901 to 215 per 100,000 birds.

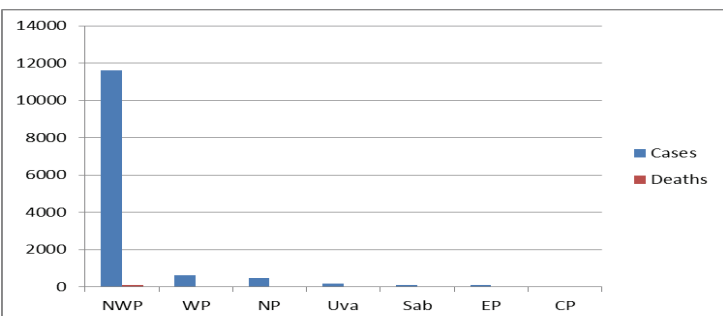
Prevalence and Prevention of NCD in Fourth Quarter



2.4.4 Salmonellosis:

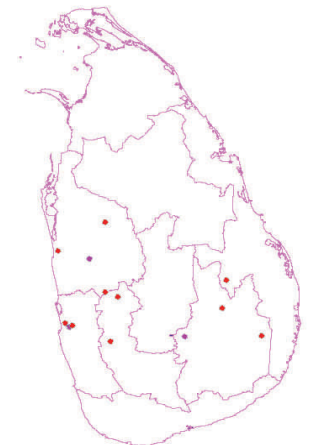
During the last quarter of 2013 a total of 13,164 cases and 204 deaths due to Salmonellosis in poultry has been reported and 41285 cases and 1091 deaths were reported in the year 2013.

Some of the parent poultry flocks are immunized with Nobilis SG9R live vaccine.



Prevalence of Salmonellosis Fourth Quarter 2013

Month	Cases	Deaths
October	3833	31
November	3891	34
December	5440	139
Total	13164	204



2.5 Swine Diseases

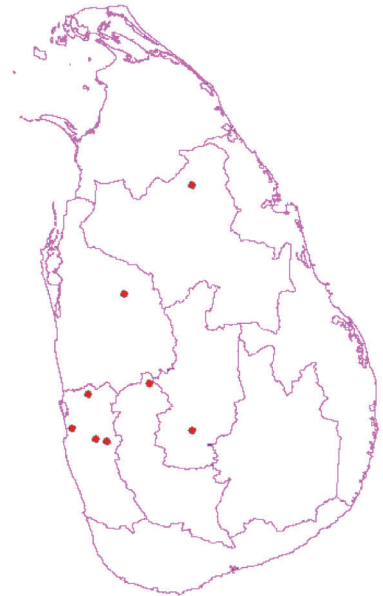
2.5.1 Porcine Reproductive Respiratory Syndrome :

Porcine Reproductive and Respiratory Syndrome (PRRS) cause reproductive failure in sows and respiratory problems in piglets and growing pigs. It is a disease, causing production losses to the swine industry. Thirty seven cases of PRRS have been suspected during the last quarter of 2013 from eight veterinary ranges.

Distribution of PRRS in the Fourth Quarter 2013

Month	Cases
October	11
November	11
December	15
Total	37

Veterinary Range	No. of Cases
Ambanpola	1
Marandagahamula	1
Dompe	4
Kosgama	21
Kebithigollawa	2
Pundaluoya	2
Rambukkana	1
Welisara	5
Total	37



3. Highly Pathogenic Avian Influenza

3. 1 National HPAI Surveillance Program : Oct-Dec 2013

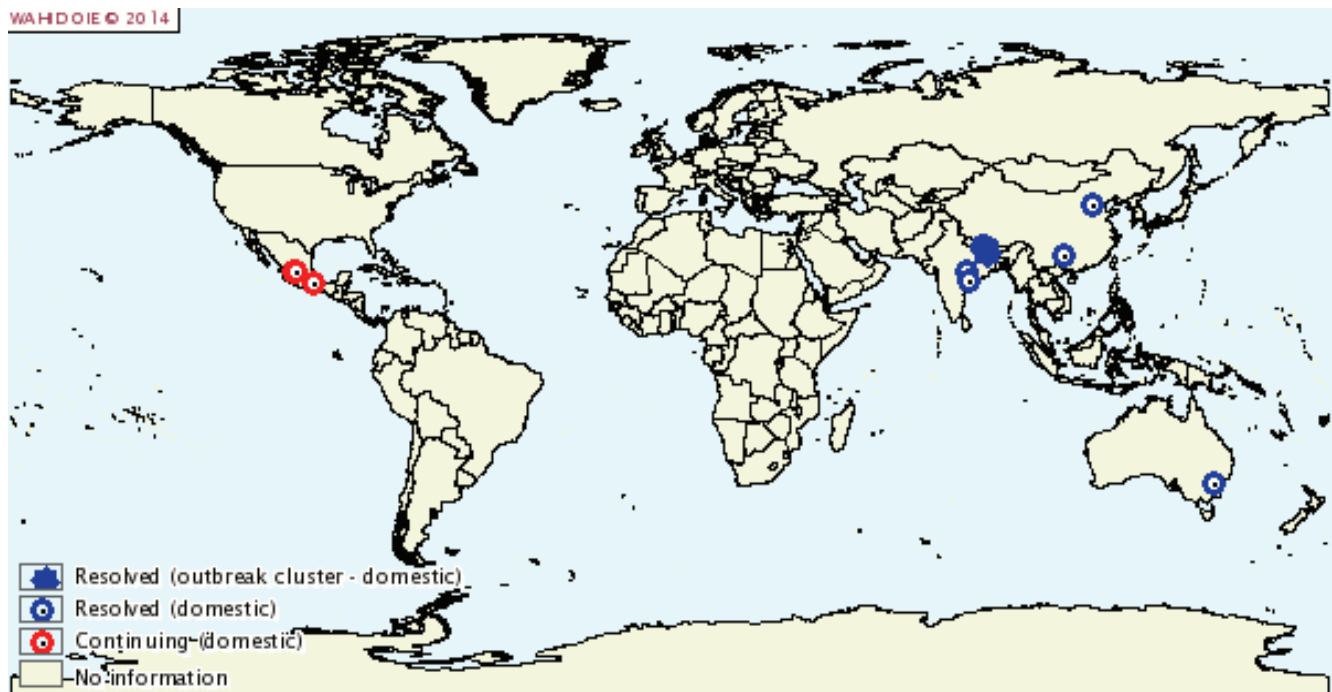
Se. No	District	Commercial Poultry Serum Samples		Pooled dropping and cloacal swabs	
		No. Tested	Results	No. tested for AIV *	Results
1	Anuradhapura	75	(-) ve	85	(-) ve
2	Badulla	30	(-) ve	-	
3	Chilaw	75	(-) ve	90	(-) ve
4	Dambulla	60	(-) ve	-	
5	Hambantota	250	(-) ve	70	(-) ve
6	Homagama	-		21	(-) ve
7	Jaffna	-		150	(-) ve
8	Kegalle	-		11	(-) ve
9	Kundasale	60	(-) ve	20	(-) ve
10	Matara	150	(-) ve	-	
11	Polonnaruwa	45	(-) ve	-	
12	Ratnapura	127	(-) ve	44	(-) ve
13	Vavuniya	75	(-) ve	92	(-) ve
14	Wariyapola	52	(-) ve	2	(-) ve
15	Welisara	-		35	(-) ve
	Total	999		620	

* Avian Influenza Virus

3.2 Global Distribution of Notifiable Avian Influenza: Oct-Dec 2013

Virus Type	Country
H7N2	Australia
H5N1	Bangladesh, India, Hong Kong (SAR-PRC), Nepal, Vietnam
H5N2	China (People's Rep. of)

3.3 Global Situation of HPAI Outbreaks Oct-Dec 2013



Compiled by:

Dr. (Ms.) Bhagya Wickramasooriya
Ms. Ranjani Weerasinghe

Division of Animal Health,
Department of Animal Production & Health.
Gatambe, Peradeniya.
Tel : 081- 2388317

Editors:

Dr. Ranjani Hettiarachchi
Deputy Director Animal Health
Department of Animal Production & Health
P.O.Box 13, Peradeniya
email: ranjanihtt@yahoo.com

Dr. A. Sivasothy
Director Animal Health,
Department of Animal Production & Health,
Gatambe, Peradeniya, Sri Lanka.
email: casiva82@yahoo.com