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Bluetongue (BTV) in Ruminants

Bluetongue disease was initially observed in the late eighteenth century in sheep, goats, cattle, and other domestic animals, as well as in wild ruminants (eg: white-tailed deer, elk, and prong-horn antelope) in Africa. A distinctive lesion in the mouths of severely affected animals is dark blue tongues which is the characteristic symptom.

AETIOLOGY

Bluetongue disease is caused by Bluetongue virus in the genus *Orbivirus* (family Reoviridae, subfamily Sedoreovirinae), which infects ruminants, notably sheep and cattle. Bluetongue virus species contain 27 recognized serotypes. The virion is a nonenveloped double-layered particle with an outer capsid that encloses a core which contains a segmented double stranded RNA genome.

EPIDEMIOLOGY

The disease is non-contagious by casual contact. Some midges (vector species) of the genus *Culicoides* (insect host) can be infected by feeding on viremic animals and can subsequently transmit BTV among susceptible ruminants. These infective midges are infective for life time. Distribution and prevalence of the disease is governed by the ecological factors, which impact on the geographical distribution of vector species. In many parts of the world, disease distribution has a seasonal occurrence. Morbidity in sheep can be reached upto 100% with mortality between 30 - 70% in more susceptible breeds. Mortality in wild deer and antelopes can reach 90%.

TRANSMISSION

Biological vectors of the disease are some midges of the *Culicoides* spp. The disease is infective in ruminant hosts within 60 days after inoculation, but more prolonged periods can be seen in

cattle. Blood of the infected animal or semen may act as sources of virus.



Culicoides biting midge

CLINICAL SIGNS

Disease outcome of the infection ranges from inapparent in the vast majority of infected animals to very severe cases. Severity depends on the factors related to the agent, host, environment and stress factors.

In acute form of the disease, pyrexia up to 42 °C, excessive salivation, depression, dyspnea and panting can be observed. Initial clear nasal discharge later becomes mucopurulent and upon drying it may form a crust around the nares. Hyperaemia and congestion of the muzzle, lips, face, eyelids and ears lead to facial oedema. Ulcerations may lead to necrosis of the mucosae of the mouth. Tongue may become hyperaemic and oedematous; later become cyanotic and protrude from the mouth. Extension of hyperaemia to coronary bands of the hoof, the groin, axilla and perineum may cause lameness as a result of coronitis, pododermatitis and myositis. Torticolis may present in severe cases, abortion or malformed lambs, pneumonia, emaciation also common in BT. In very severe cases, either death within 8 - 10 days or long recovery with alopecia, sterility and growth retardation can happen.



Mucopurulent nasal discharge



Hyperaemic coronary band



Facial oedema



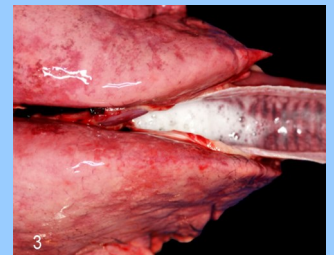
Cyanotic protruded tongue

LESIONS

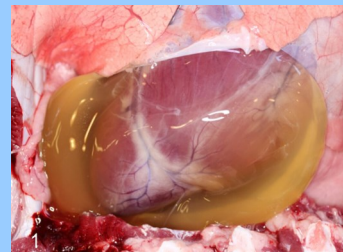
Congestion, oedema, haemorrhages and ulcerations of digestive (mouth, oesophagus, stomach, intestine,) and respiratory mucosae (trachea) are the commonest lesions in Bluetongue. In more complicated cases, severe bilateral bronchlobular pneumonia is significant. In fatal cases, lungs may show interalveolar hyperaemia, severe alveolar oedema and the bronchial tree may be filled with froth. Thoracic cavity and pericardial sac may contain large quantities of plasma like fluid. Distinctive haemorrhages found at base of pulmonary artery. Congestion of hoof laminae and coronary band, hypertrophy of lymph nodes and splenomegaly can also be observed.



Ulcerated digestive tract mucosae



Froth filled bronchi



Hydropericardium



Haemorrhages in papillary muscles

DIAGNOSIS

Clinical evaluation: The typical clinical signs of Bluetongue enable a presumptive diagnosis, especially in the areas where the disease is endemic.

Postmortem examination: Presence of postmortem lesions like petechiae, ecchymoses or hemorrhages in the wall of the base of pulmonary artery and focal necrosis of the papillary muscles of the left ventricles are highly characteristic lesions usually obvious in severe clinical cases.

Laboratory diagnosis: Laboratory diagnosis of Bluetongue is based on virus isolation, identification of viral RNA and serological tests.

- **Sampling:**

Living animals: whole blood in heparin or EDTA

Freshly dead animals: spleen, liver, red bone marrow, heart blood, lymph nodes.

Aborted and congenitally infected newborn animals: pre-colostrum serum plus same samples as for freshly dead animals.

All samples have to be preserved at 4 °C, and not frozen.

- **Procedures:**

Isolation of the agent: Intravascular inoculation in 10–12 day old embryonated chicken eggs or inoculation of mammalian or insect cell culture.

Identification of the agent: Mainly two immunological methods are used to identify the virus. Serogrouping of virus can be done by Immunofluorescence, Antigen capture ELISA and Immunospot test. Other immunological method is serotyping by virus neutralization via Plaque reduction, Plaque inhibition, Microtitre neutralization or Fluorescence inhibition test. In addition to immunological methods, Real-time RT-PCR tests and RT-PCR chain reactions, capillary sequencing or whole genome sequencing techniques also can be used.

Serological tests: Under serological tests, Competitive ELISA, Indirect ELISA and Agar gel immunodiffusion techniques can be used to diagnose the disease in infected animal.

PREVENTION AND CONTROL

Sanitary prophylaxis: No efficient treatment is available for this viral infection. In disease free areas, animal movements should control and quarantine procedure should follow. Vector controlling also plays a major role especially in aircraft and during transportation on land. In infected areas, vector control both during transportation and in animal housing areas by using physical barriers/ insecticides/ alarm systems/ elimination of breeding sites should be applied.

Medical prophylaxis: Vaccination of animals with live attenuated and killed BT vaccines is being practiced in certain countries. These attenuated vaccines are serotype specific and it is advised, not to be used during *Culicoides* vector seasons because these insects may transmit the vaccine virus from vaccinated to non-vaccinated animals including other ruminant species. This may result in re-assortment of genetic material and give rise to new and potentially more pathogenic viral strains.

GLOBAL DISTRIBUTION

Blue Tongue has a significant global distribution in regions where the insect vector is present, including Africa, Asia, Australia, Europe, North America and several islands in the tropics and subtropics. The virus is maintained in areas where the climate will allow biting midges to survive over winter.

Generally, sheeps found in areas where the disease is endemic are naturally resistant to BT. Outbreaks occur when susceptible sheep, particularly European breeds are introduced to endemic areas, or when the virus is introduced to a region by windborne movement of infected *Culicoides*. Occurrence of BT generally parallels vector activity surging during periods of high temperature and rainfall and subsiding with the first frost or severe cold weather.

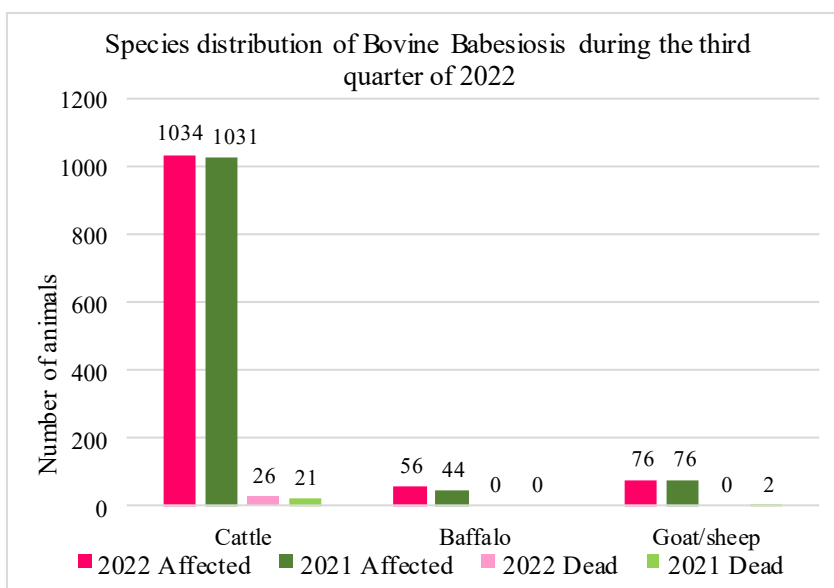
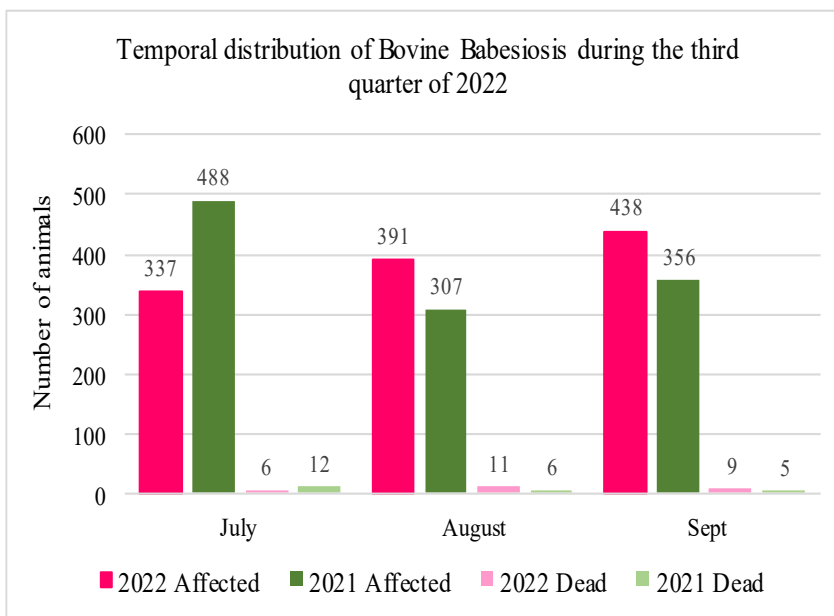
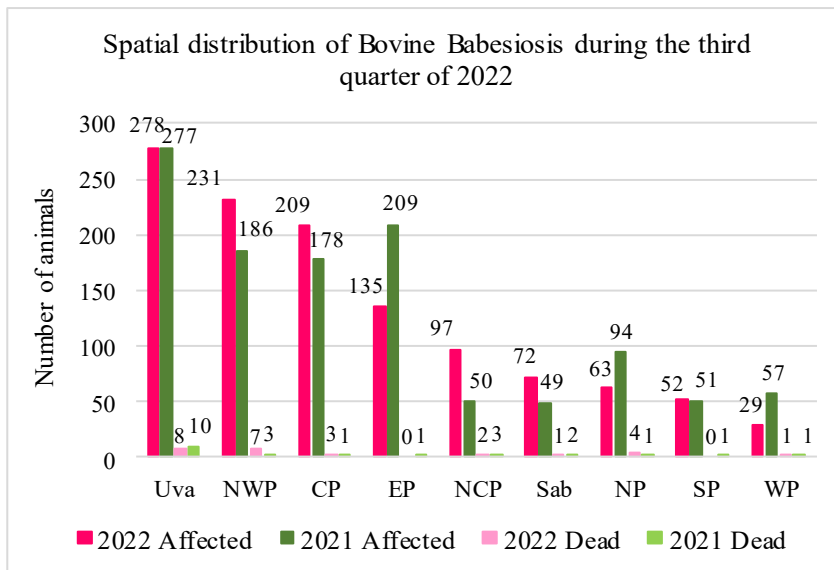
Compiled by: Dr. D. R. K. Perera.

Reference: <https://msdvetmanual.com>, <https://www.woah.org>, <https://www.nadis.org.uk>, <https://www.aphis.usda.gov>, <https://www.sciencedirect.com>

2. Status of Livestock Diseases Third Quarter (July - Sept) - 2022

2.1 Bovine Diseases

2.1.1 Babesiosis :

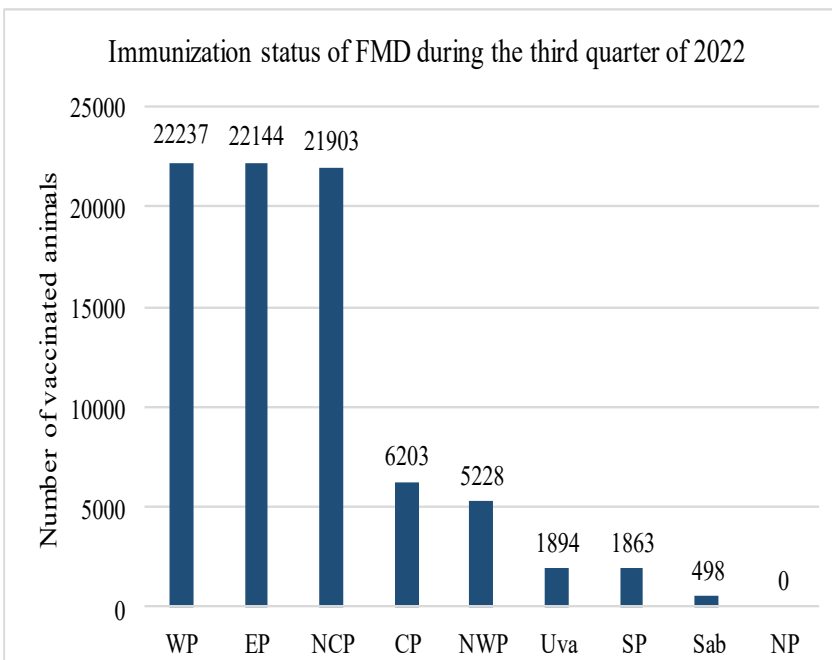
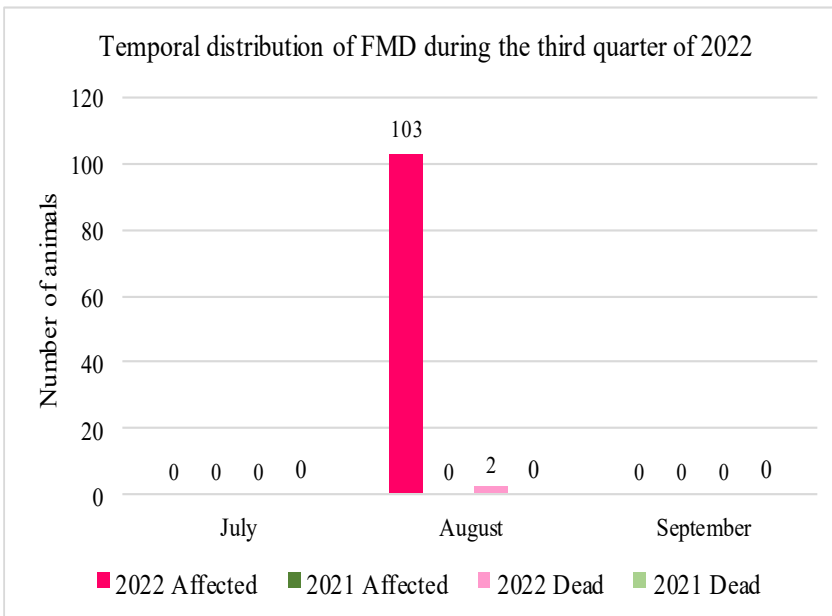
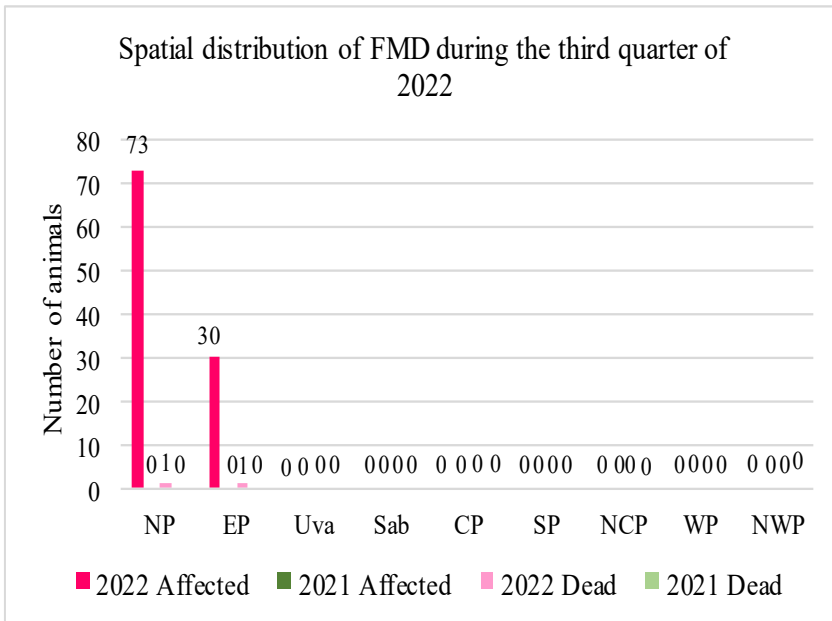


Bovine Babesiosis is one of the commonest cattle disease in Sri Lanka, which usually reports from almost all the provinces during the every month of the year. During the third quarter of 2022, highest number of cases were reported from Uva province as same as the third quarter of previous year. It is 278 cases with 8 deaths which represents 23.84% from total number of cases reported during the quarter period. Significant number of cases were reported from North Western and Central provinces as well. Lowest number of cases were reported from Western province as 29 cases with 1 death. Most significant decrease in disease incidence was observed in Eastern province as 35.4% when comparison with the previous year.

According to the temporal distribution, highest number of cases were reported in September month and lowest number of cases were reported in July month. The average number of cases per month is slightly higher in 2022 (388 cases per month) third quarter than the previous year same period (383 cases per month).

As usual, species distribution reveals the highest disease incidence in cattle than the other susceptible species. During the third quarter of 2022, Babesiosis affected livestock population composition is like, Cattle 88.6%, Buffalo 4.8% and Goat/Sheep 6.5%. When comparing the death rates of cattle during the particular period of both years, it is 2.5% in 2022 and 2% in 2021. But when considering the death rates of all species, death rate of Goat/sheep is the highest.

2.1.2 Foot and Mouth Disease:



Foot and Mouth Disease is a highly concerning endemic livestock disease in Sri Lanka. Though it has very low mortality rate, economic impact of the disease is very high due to its highly contagious nature followed by high morbidity.

During the third quarter of the 2022, only 103 cases with 2 deaths were reported from Northern and Eastern provinces of the country. Over 70% of them were reported from Manthai East veterinary range of Northern province. Rest of the cases were reported from Ampara veterinary range of Eastern province. These two disease occurrences were considered as sporadic disease outbreaks which have no inter-relation. There were no FMD cases were reported in Sri Lanka during the same quarter of 2021.

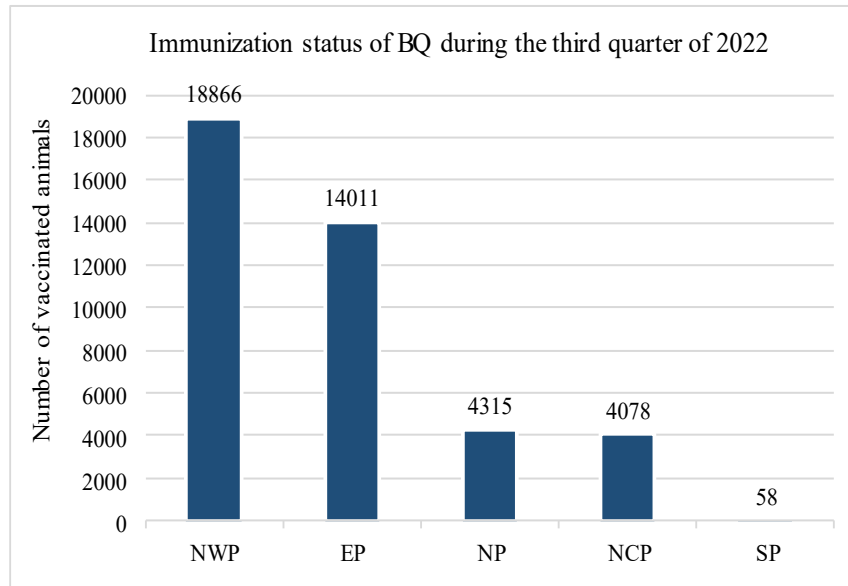
Temporal distribution shows that, all 103 infected cases and deaths were reported during the August month of the considered quarter of 2022.

As the main preventive measure of the disease, bi-annual pre-exposure vaccination has been practicing in Sri Lanka for large ruminants. While conducting vaccination program, the provinces with higher risks have been prioritized to prevent the disease outbreak and curtail the disease spreading once they are out broken. According to that, Western, Eastern and North Central provinces are prioritized as high risk areas and respectively 27.1%, 27% and 26.7% amount of vaccines were distributed to those provinces during the third quarter of 2022.

2.1.3 Black Quarter:

During the September month of the third quarter of 2022, one Black Quarter outbreak was reported from Northern Province (from Karupukutty village in Vavuniya South veterinary range of Vavuniya District.) of Sri Lanka. Similar disease outbreak was reported during the same month of previous year as 7 Black Quarter cases with 3 deaths.

As this is an endemic disease to dry zone of Sri Lanka, which effectively controlled through prophylactic vaccination program conducted in targeted provinces, currently it is reported as very few random sporadic cases without creating severe outbreaks.

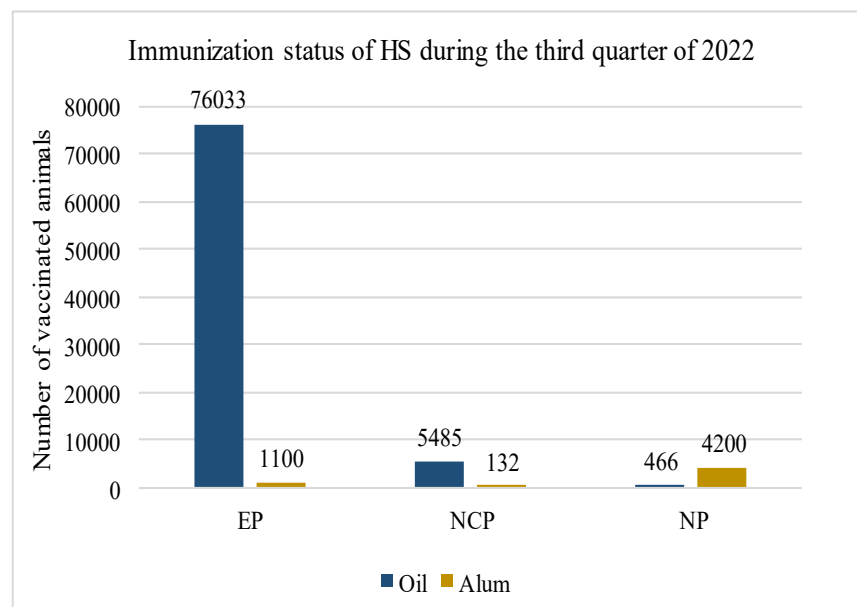


North western province, Eastern province, Northern province and North Central provinces are the dry zone provinces where BQ reported throughout the past few years of the country. Therefore, they have been targeted for preventive vaccination. According to that, the majority of vaccines 45.64%, were distributed to North western province, 33.9% were distributed to Eastern province while 10.44%, 9.8% and 0.1% of vaccines were distributed to the Northern, North Central and Sabaragamuwa Provinces respectively.

2.1.4 Hemorrhagic septicemia:

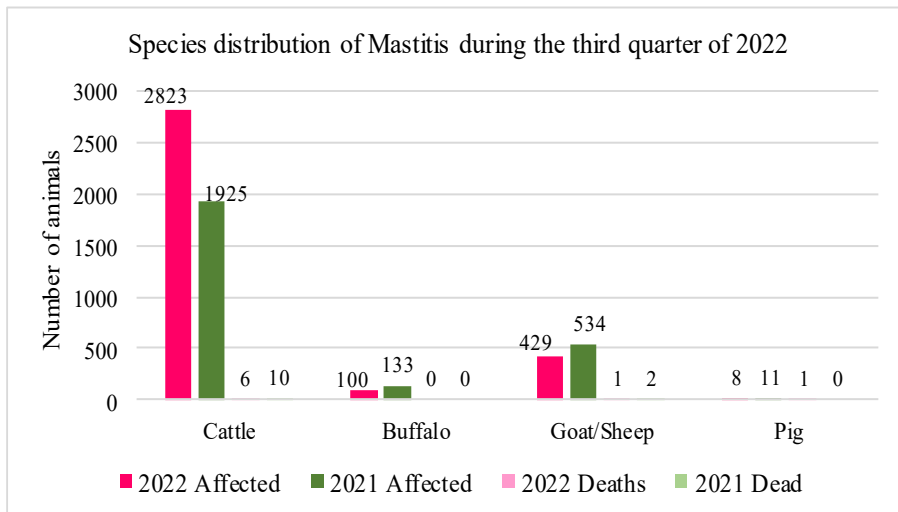
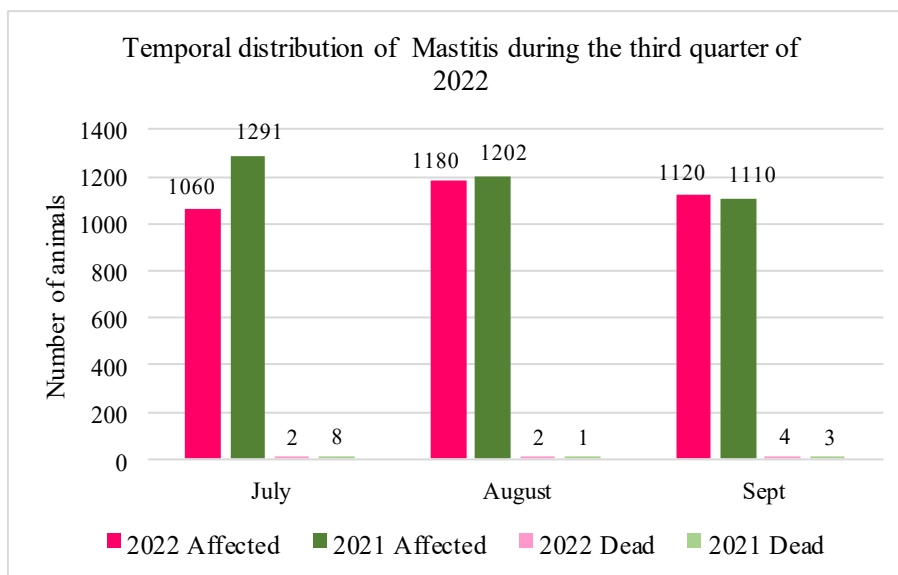
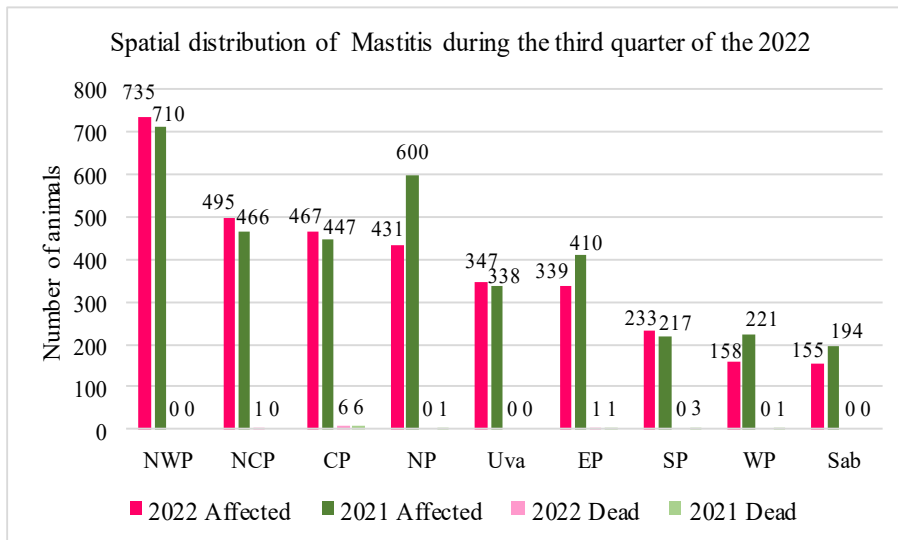
During the August of 2022, one outbreak of Hemorrhagic septicemia was reported from North Central province with 38 infected animals with 17 deaths. It was reported from the Medirigiriya Veterinary range of the Polonnaruwa district. The disease situation is different from previous year as there were no outbreaks reported in third quarter of 2021.

Vaccination program is conducted by DAPH with the collaboration of field Veterinary surgeons to prevent and control the disease in high risk provinces of the country. Oil base prophylactic vaccine has been used in Eastern, North Central and Northern provinces as these provinces are identified as more susceptible areas for HS, as per the disease



epidemiological data of past few years. According to that, 76033 oil base vaccines to Eastern province, 5485 to North central province and 466 to Northern province were distributed as disease preventive measure. According to the reported data, totally alum adjuvant vaccines were used in North Central, Northern and Eastern Provinces as a disease control measure to arrest the disease spreading from outbreak area in North Central Province through nomadic movements of cattle.

2.1.5 Mastitis:



Mastitis Control Program	
Amount of CMT reagent issued (Liter)	55.2
Number of Mastitis screening (CMT) Tests performed	2678
Number of milk samples tested for ABST	264
Amount of teat dip solution issued (Liter)	703.5
Amount of Udder infusion vials freely issued	
Lactating Cow	2261
Dry Cow	563

Mastitis is a disease condition, which known as the inflammation of mammary tissue. This is the highest concerning disease in the dairy industry of the world as it has a huge impact on the milk quality and quantity of dairy animals. In Sri Lanka, National Mastitis Control Program is conducted by the Department of Animal production and Health to facilitate the dairy farms to avoid the Mastitis, early detection as well as treatments to Mastitis.

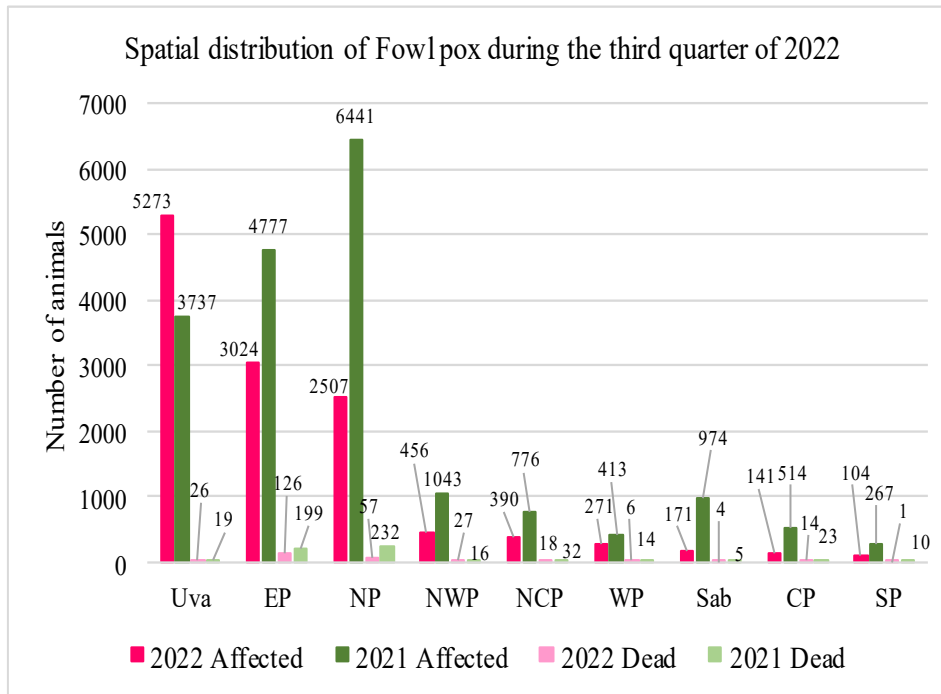
Spatial distribution of Mastitis reveals island wide distribution of the disease in all the provinces of the country. Totally it was 3360 cases during the third quarter of 2022, which is 6.74% reduction of the disease incidence comparing to the same quarter of previous year. North western province reported the highest number of cases as 21.87% and Sabaragamuwa province reported the lowest number of cases as 4.61% from total number of cases reported during the quarter. Northern province shows the great reduction in Mastitis cases as 28.16% than the second quarter of previous year.

Temporal distribution does not show significant deviation from same quarter of previous year except slight reduction of cases during the July 2022 by 17.8% than same month of 2021.

As per the graph of species distribution of the disease, during the second quarter of this year, number of reported cattle mastitis cases were significantly increased by 46.6% when comparing to the same quarter of 2021.

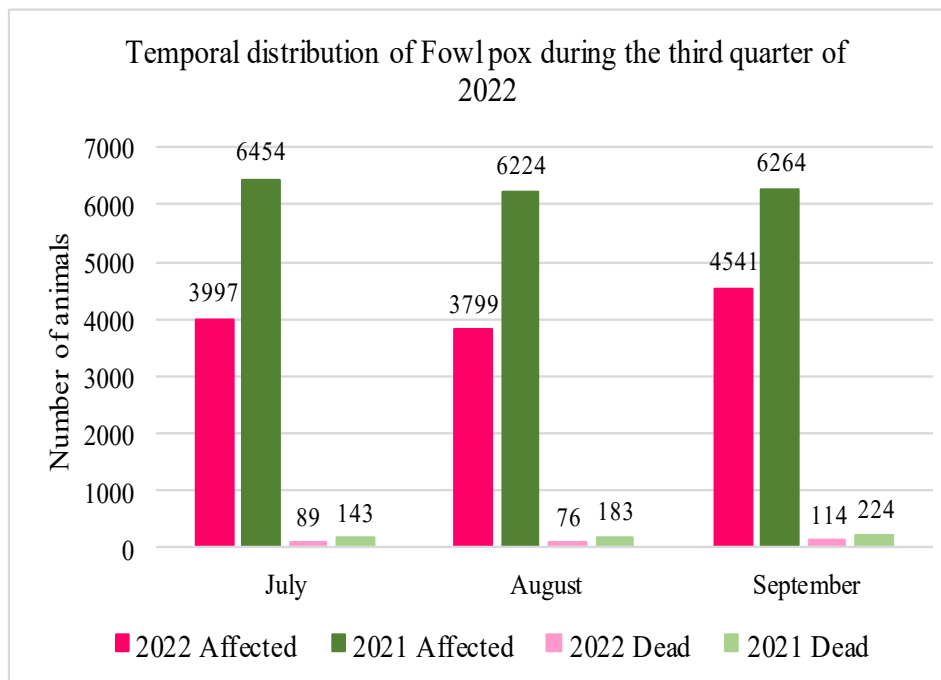
2.2 Poultry Diseases

2.2.1 Fowl pox:



Fowl pox is one of the commonest poultry disease in Sri Lanka which usually affect the poultry in all ages. The disease is preventable by vaccinating the birds by 4-5 weeks and 14-15 weeks of age. Most of the local commercial poultry farmers vaccinate the birds against the disease to prevent the production drop due to the high morbidity of this disease.

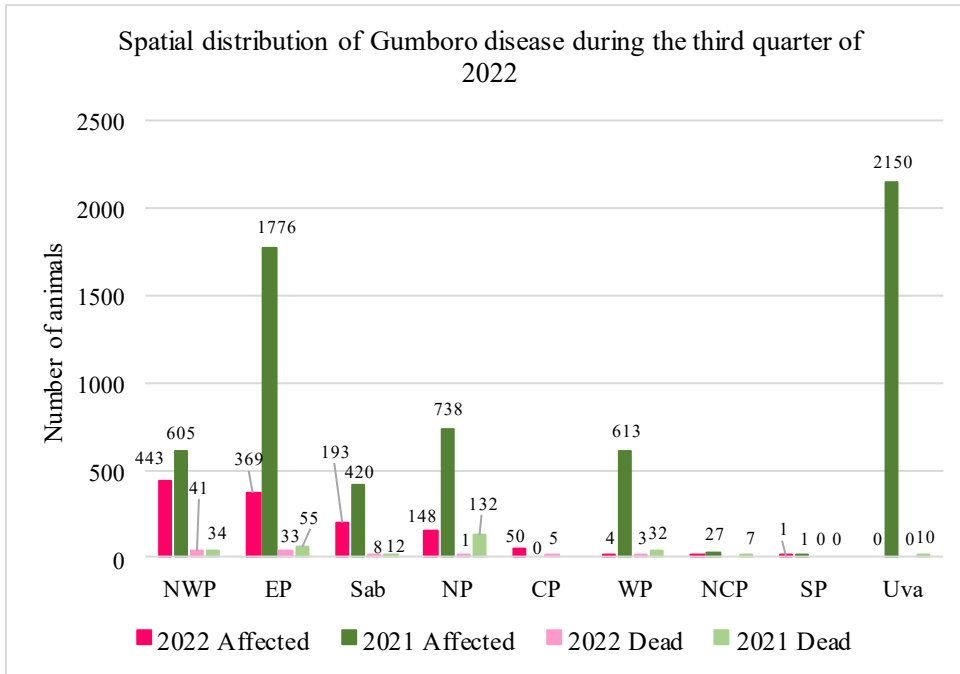
The disease has been reported from all provinces of the country during the considering period. But it's incidence has been reduced by 34.86% when comparing with the same quarter of 2021. As per the graph indicated, reported cases number has been decreased in all the provinces except Uva province. Significant reduction of cases can be observed in Northern and Eastern provinces by 61.07% and 36.69% respectively. As similar to the previous year, least number of cases were reported from Southern and Central provinces of the country.



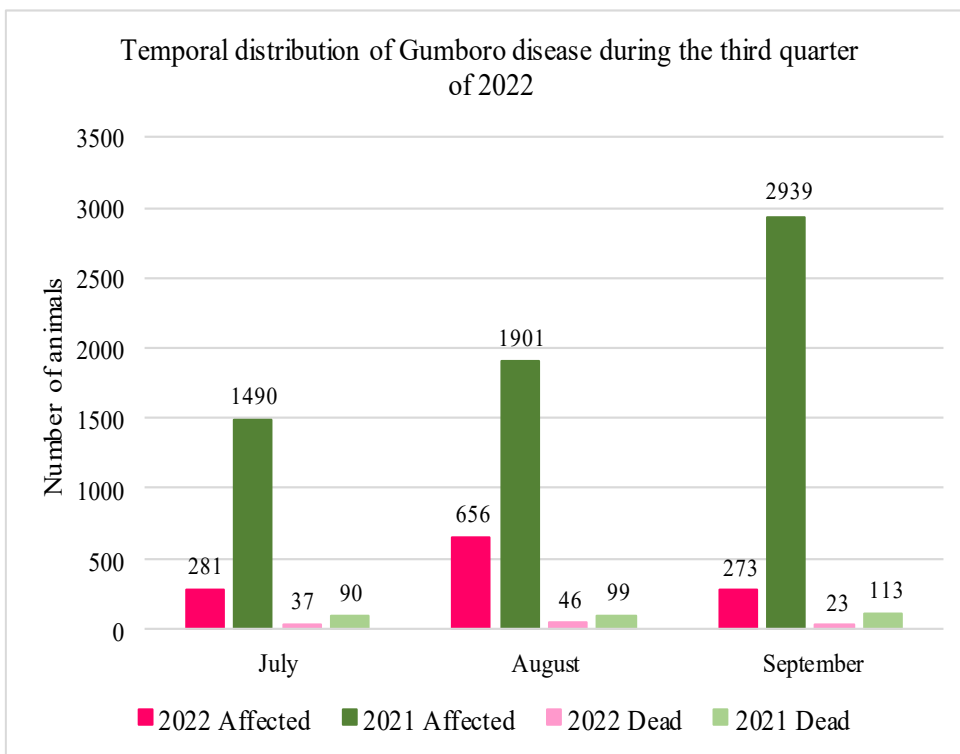
Temporal distribution of the Fowl pox disease does not show much variation throughout the period although the disease incidence is significantly different from each year. In 2021 third quarter average number of reported cases is 6314 cases per month. But in 2022 third quarter, it has been reduced to 4112 cases per month.

According to the disease distribution data of 2022 third quarter, totally 12,337 cases with 279 deaths were reported, though it was 18942 cases with 550 deaths during the same quarter of previous year same quarter. Average death rate out of diseased (2.26%) was also decreased during this year third quarter when comparing to the previous year (2.9%).

2.2.2 Gumboro Disease:



Gumboro disease, which is known as Infectious Bursal Disease is one of the highly concerning disease in Sri Lanka due to its huge morbidity and mortality in birds in very young age. As this is a vaccine preventable disease, almost all the bird flocks which rear for commercial purposes Sri Lanka are vaccinated for the disease by the end of the 2nd and 4th week of the age.

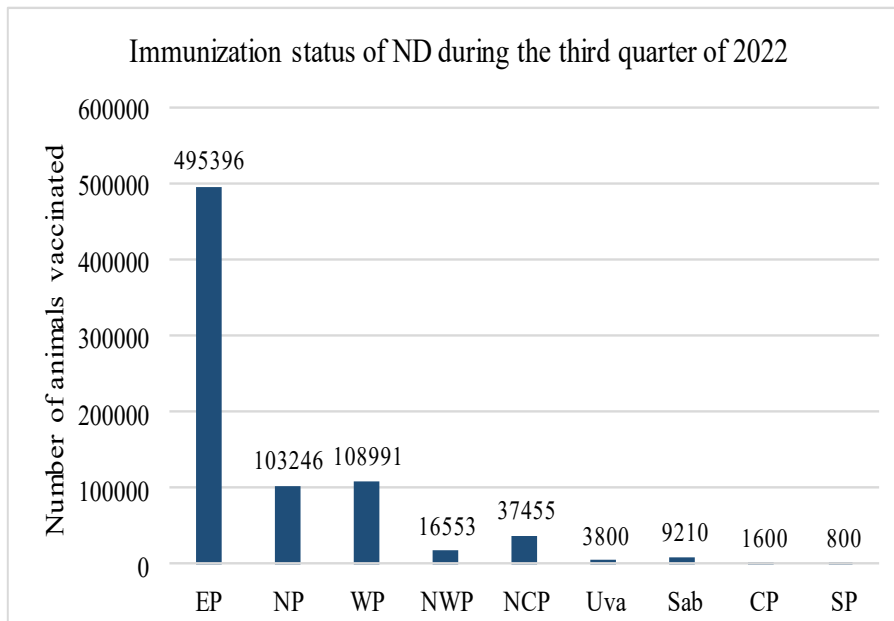
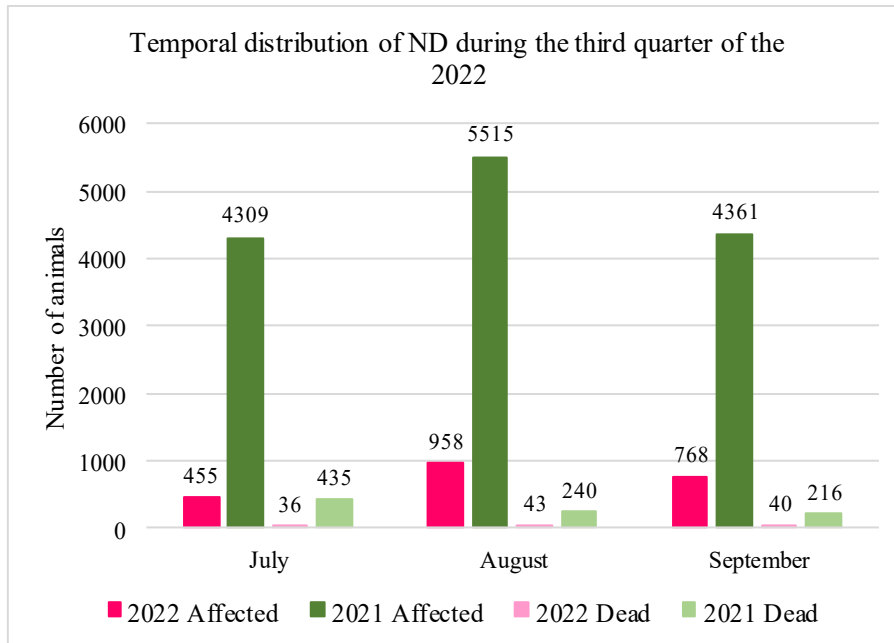
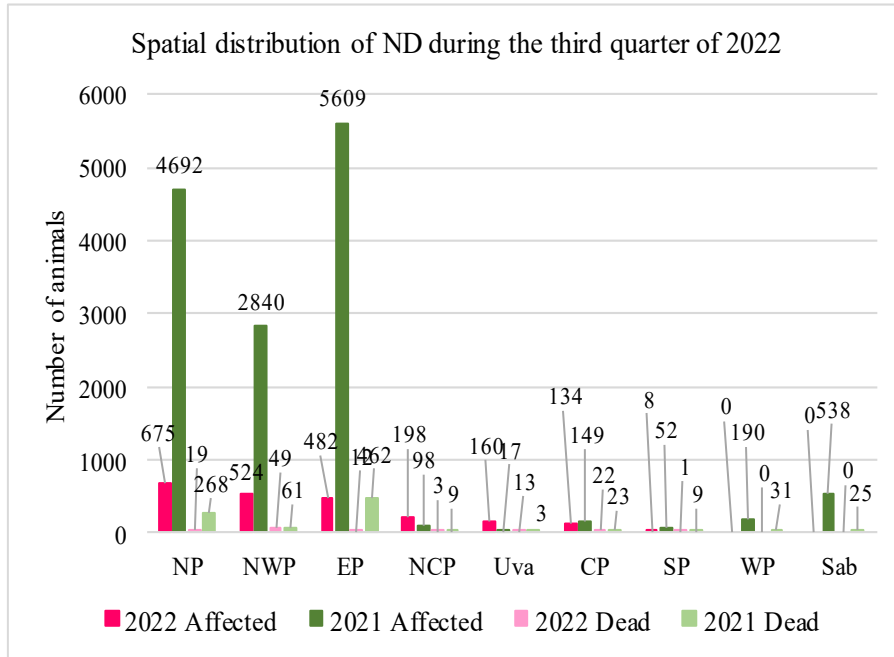


During the considering quarter of the 2022 and 2021, spatial distribution of the disease shows significant differences in total disease incidence as well as in Uva, Eastern, Northern and Western Provinces. Total number of cases during the quarter has been reduced by 80.88% in 2022 (1210 cases with 106 deaths) when comparing to 2021 (6330 cases with 302 deaths). Highest incidence of the disease was reported from North Western Province as 443 cases with 41 deaths. Lowest number of cases were reported from Southern province

as 1 case without any deaths. Uva province shows the most significant difference as no any diseased cases during 2022 third quarter while it was 2150 in previous year same quarter.

Temporal distribution of the Gumboro disease exhibits a significant difference in the distribution pattern as well as the monthly disease incidence of the same quarter of both years. During 2021 disease incidence was gradually increased in same rate within the considering time period, reporting highest number of cases in September month. But in 2022 third quarter lowest number of cases were reported in September month as 273 cases with 23 deaths, which is 22.56% from total cases reported during the quarter period and highest number of cases were reported in August month as 54.21% from total cases.

2.2.3 Newcastle Disease:

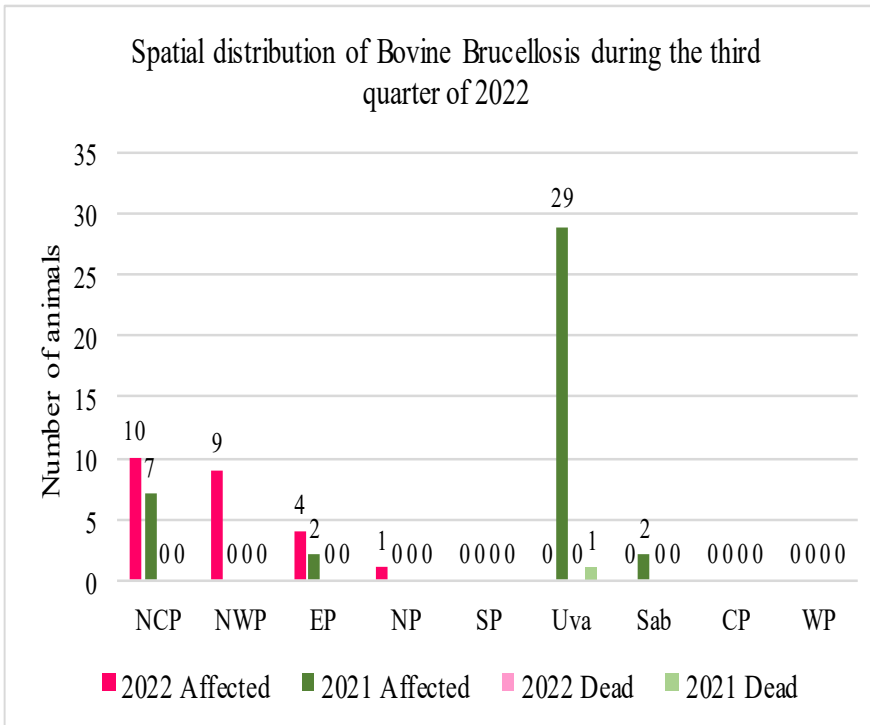


Spatial distribution of New castle disease (ND) shows very low disease incidence during the period of 2022 third quarter comparing to 2021. Eastern and Northern provinces indicate the significant decrease in number of cases, by 85% caused this huge reduction of total disease incidence. Totally, 2181 cases with 119 deaths were reported from 2022 third quarter which is 84.62% reduction of disease incidence than the same quarter of previous year. Highest disease incidence was reported from Northern province as 675 cases with 19 deaths while Southern province reporting the lowest disease incidence as 8 cases with 1 death. No new cases were reported from Western and Sabaragamuwa provinces during the period.

Temporal distribution of the disease shows similar distribution pattern in both quarters but in different monthly disease incidences. As per the graph highest number of cases were reported in August month as 958 cases and lowest number of cases were reported from July month as 455 cases. Death rates of the disease shows higher death rate (death: affected ratio is 0.1) in 2021 July when comparing to rest of the months of both years (average death: affected ratio is 0.04). According to the reported data, ND vaccine distribution is indicated in the graph. Majority of ND vaccines were distributed to Eastern province (63.7%) where have large number of small to medium scale backyard poultry farms.

3. Status of Zoonotic Diseases Third Quarter (July - Sept) - 2022

3.1 Bovine Brucellosis :

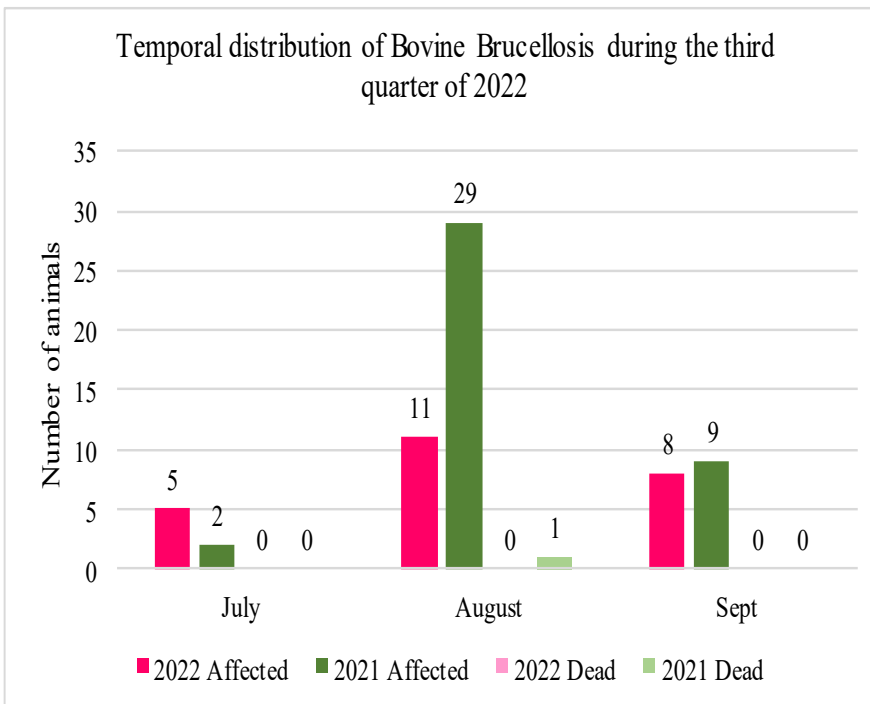


During the third quarter of 2022, Bovine brucellosis has been reported only in four provinces of Sri Lanka. Among them, highest incidence was reported from North Central province as 10 cases, while lowest incidence was reported from Northern province as 1 case per quarter. Significant difference of the disease incidence can be seen in Uva province, as no cases were reported in current quarter though it was highest as 29 cases in 2021 third quarter.

With regard to the temporal distribution of the disease during the considering period, though the disease incidence of 2022 has been significantly reduced than previous year, it shows the similar temporal distribution patterns.

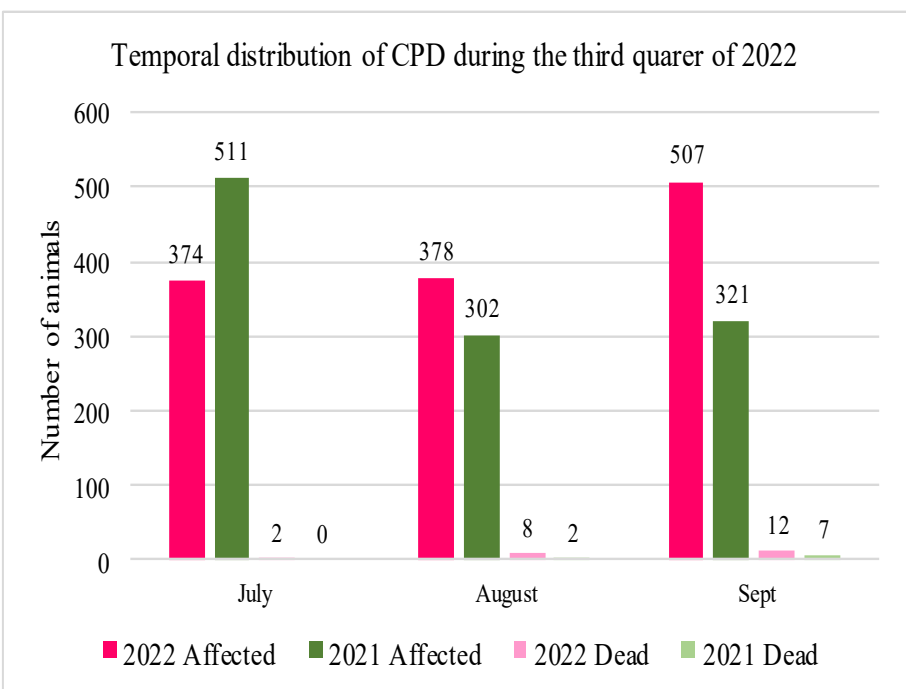
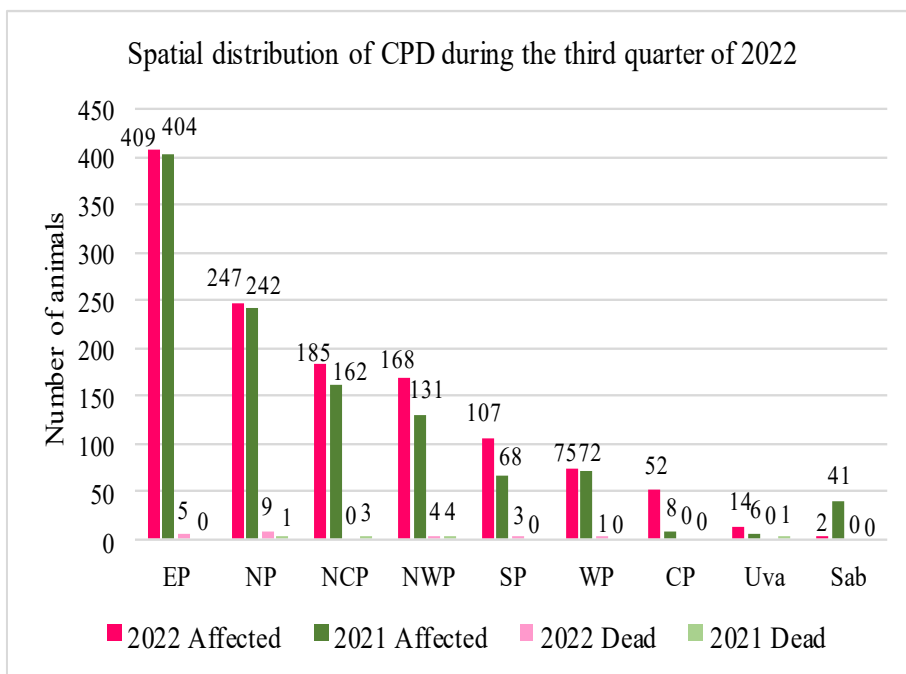
In conclusion, both graphs clearly show the significant decrease (by 40%) in reported number of affected animals in 2022 third quarter than the corresponding quarter of 2021.

In order to control Brucellosis in Sri Lanka, Brucellosis vaccination and Surveillance Program conduct with the collaboration of Animal Health Division and VRI. Under this program, 584 animals were vaccinated with S19 Brucella vaccine during the quarter period. 606 milk samples from milk collecting centers were screened to identify the infected farms. Further, 343 animals in MRT positive farms were subjected to RBPT. Totally, 87 samples were subjected to RBPT by VRI and 15 of them were positive. 80% of RBPT positive samples were got positive for CFT, confirming the presence of Brucella in 12 samples.



Brucellosis Control Program	
Number of milk samples screened by VIOs with MRT	606
No. of animals screened by VIOs in suspected herds with RBPT	343
Number of samples submitted by VIOs to VRI for CFT	95
Number of animals vaccinated with S19 vaccine	584
Total number of samples subjected to RBPT (by VRI)	87
Number of RBPT positive samples	15
Number of CFT positive samples	12

3.2 Contagious Pustular Dermatitis:



Contagious Pustular Dermatitis (CPD) is a zoonotic disease which can transmit to human from small ruminants. Usually, it is reported from many provinces of the country depending on the animal population and management system of them. Although CPD leads to mild cutaneous lesions on animals, involvement of secondary bacterial infections may aggravate the cutaneous lesions to severe wounds. This can cause a considerable economic loss due to production drop in productive animals, death and growth retardation in young animals. Therefore, vaccination of susceptible animals and proper treatments to the infected animals are considered as the effective methods of controlling the disease.

During the third quarter of 2022, cumulative number of CPD infected animals in whole country is 1259. It is 11.02% increase of disease incidence than previous year. But the disease shows similar spatial distribution patterns during both quarters except in Sabaragamuwa province. Higher number of cases were reported from

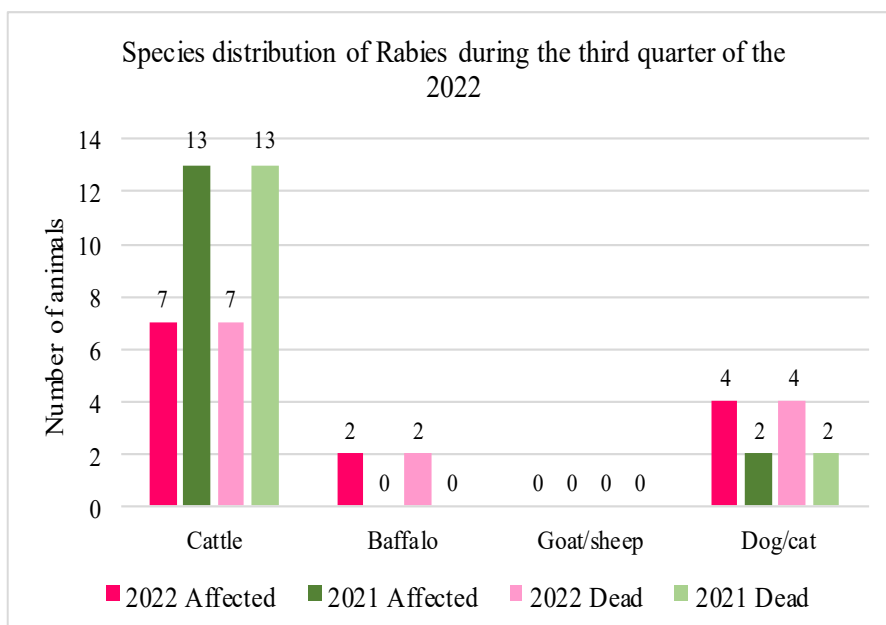
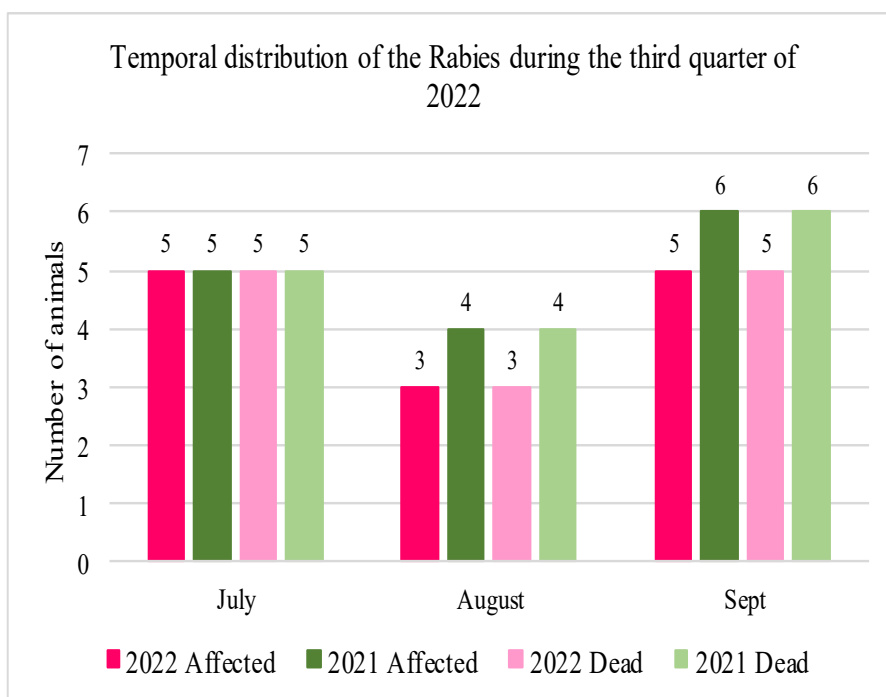
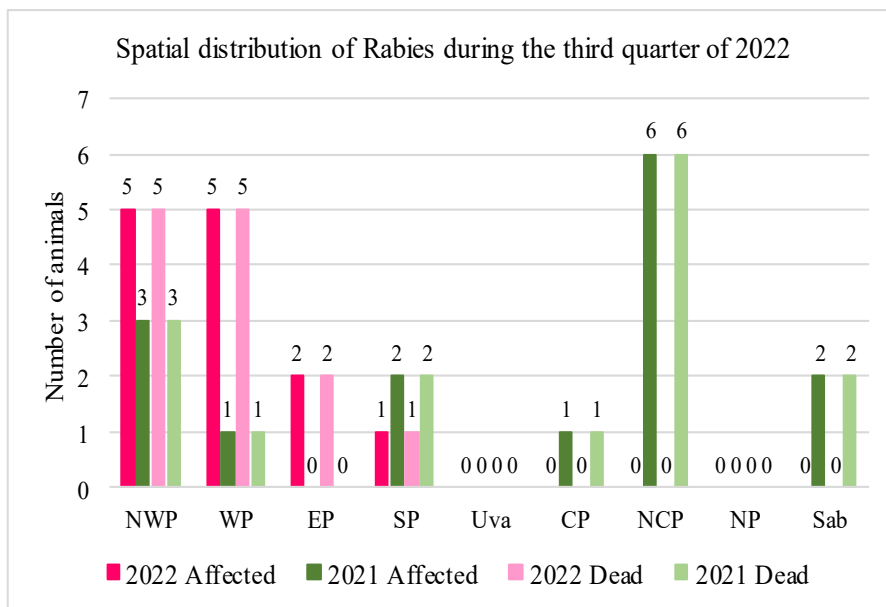
the Dry zone provinces where have high goat and sheep population. Highest disease incidence 409 cases with 5 deaths were reported from Eastern province of the country. Lowest number of cases were reported from Sabaragamuwa province as 2 cases without any deaths.

Temporal distribution of CPD shows different distribution patterns during the two quarters.

In 2022, highest disease incidence was reported in September month as 507 cases with 12 deaths. But in 2021 third quarter, highest disease incidence was reported in July as 511 cases with out any deaths. Highest death rate was reported in 2022 September as 2.36% .

In order to control CPD in small ruminant population of Sri Lanka, vaccination program is conducted by the Department of Animal Production and Health, through Veterinary Investigation Centers (VICs). The vaccine is prepared in VICs and vaccinate the susceptible animals in infected herd. Under this control program, 16 farms were vaccinated during the third quarter of 2022. Majority of those farms were located in Northern province.

3.3 Rabies:



Rabies is a non-curable preventable viral disease. It most often transmitted through the bite of rabid animals. Though it is not a commonly reporting disease in Sri Lanka, it consider as the highest concerning zoonotic disease.

During the third quarter of 2022 totally 13 cases were reported from 4 provinces of the country. It is a 13% decrease in quarterly disease incidence when comparing to the same period of previous year. North Western and Western provinces reported highest disease incidences as 5 cases. North Central province did not reported any cases during current quarter, though it reported 6 cases in the same quarter of previous year.

Comparatively higher number of cases were reported in July and September months in the third quarter of both years.

Species distribution reveals the higher susceptibility of cattle to the Rabies than other species. But the disease incidence of them has been significantly reduced (by 46%) in 2022 third quarter than previous year. The reason for the higher rabies incidence of cattle is considered as the bite by rabies infected dogs or exposure to disease transmitting wild animals while free grazing in common grazing lands adjacent to jungle areas. Reported number of cases were doubled in Dogs/Cats when comparing both quarters. Though Sheep/goat cases were not reported during both quarters, two new buffalo cases were reported in current quarter from Western and North Western provinces of the country.

3.4 Highly Pathogenic Avian Influenza:

3.4.1 National HPAI Surveillance Program:

1. No. of serum samples collected from Commercial Poultry	797
2. No. of dropping samples collected from the Hotspots of Migratory Birds	836
3. No. of cloacal swabs collected from Backyard Poultry	905
4. No. of samples collected from Live Bird Markets	147
5. No. of cloacal swabs collected from Pet Bird Establishments	140
6. No. of samples collected from Poultry Processing Establishments	730
7. No. of serum samples collected from Duck Farms	235
8. No. of cloacal swabs collected from Ducks	191

Se. No	District VIC	Serum samples from commercial poultry		Fresh droppings, cage swabs and cloacal swabs of migratory birds & Backyard poultry	
		No. tested	Results	No. tested	Results
1	Ampara	225	Negative	70	Negative
2	Anuradhapura	420	Negative	30	Negative
3	Badulla	61	Negative	–	–
4	Chilaw	307	Negative	110	Negative
5	Colombo	246	Negative	–	–
6	Dambulla	20	Negative	–	–
7	Gampaha	408	Negative	148	Negative
8	Homagama	–	–	17	Negative
9	Kandy	112	Negative	15	Negative
10	Kalutara	75	Negative	15	Negative
11	Kegalle	41	Negative	35	Negative
12	Kilinochchi	200	Negative	200	Negative
13	Kurunegala	60	Negative	15	Negative
14	Moneragala	60	Negative	60	Negative
15	Polonnaruwa	30	Negative	40	Negative
16	Trincomalee	210	Negative	90	Negative
17	Vavuniya	125	Negative	–	–
	Total	2600		845	

Highly Pathogenic Avian Influenza (HPAI) is an exotic disease to Sri Lanka.

Under National HPAI Surveillance Program, different types of samples were collected from all the districts of the country to monitor the HPAI situation and identify the disease as early as possible if it has been introduced. Under this program, 1032 serum samples were collected from commercial poultry and ducks. Totally, 1383 cloacal swabs were collected from Backyard poultry, Live Bird Markets, Pet Birds Establishments and Duck farms. 836 Fresh droppings samples were collected from the Hotspots of migratory birds and different types of 730 samples were also collected from Poultry Processing Establishments. According to that, totally 3981 samples were collected from various possible risk spots and dispatched to the reference laboratory during the third quarter of 2022.

The samples were checked in VRI for the detection of Avian Influenza virus. During the considering period of the current year, 2600 of serum samples and 845 number of other samples (fresh droppings, cage swabs and cloacal swabs) were checked in virology laboratory of VRI and all of them were gave negative results for viral detection tests.

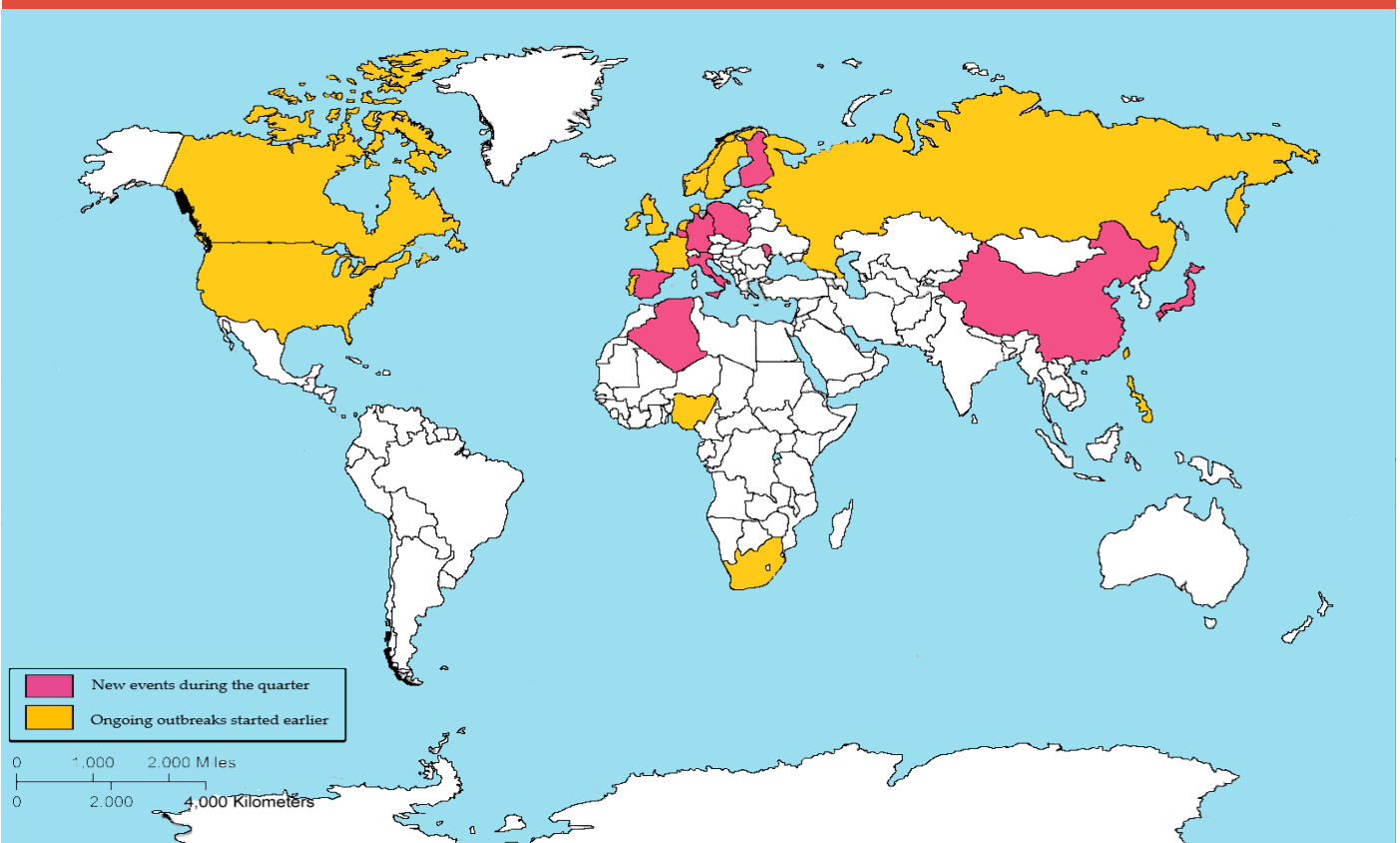
As per the laboratory confirmed data, Sri Lanka is able to maintain the Highly Pathogenic Avian Influenza disease free status further.

3.4.2 Global Distribution of Notifiable Avian Influenza:

During the third quarter of 2022, initial occurrences or repeated occurrence of the disease by a new strain of HPAI were not reported from any country, zone or compartment of the world. But on-going events of previously reported outbreaks were reported to World Organization of Animal Health through follow up reports. Ongoing events of H5N1 outbreaks were reported from Nigeria, Philippines, France, Netherland, United Kingdom, South Africa, Canada, United States of America, Germany, Portugal, Spain, Belgium, Denmark, Finland, Norway, Poland, Russia, Sweden, Ireland and Portugal. One ongoing event of H5N2 outbreaks from Chinese Taipei and one H5N5 outbreak from Norway were reported during the period. New events or recurrence of an eradicated disease were also reported from several countries of the world. According to them, H5N1 outbreaks were reported from Germany, Russia, Belgium, Italy, UK, China, Ireland, Spain, Algeria, Poland, Moldova, China and Japan. One H5N5 outbreak was reported from Finland.

In the third quarter of 2022, HPAI outbreaks were reported in both Poultry and Non-poultry sectors throughout the world. According to the HPAI Situation reports from July to September 2022, 247 outbreaks were reported in poultry sector from 27 countries and 529 outbreaks were reported in non-poultry sector from 34 countries. It was revealed that, the predominant subtype of the disease during the considering quarter is H5N1.

3.4.3 Global Situation of Notifiable Avian Influenza outbreaks:



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