



Animal Health Activities Report 2021-2023

**Epidemiology Cell
Department of Livestock Services, Bangladesh**



**Food and Agriculture
Organization of the
United Nations**



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Fund**



Message

I am delighted to know Epidemiology Cell, Department of Livestock Services (DLS) with the support of the Food and Agriculture Organization (FAO) prepared the Animal Health Activities Report for the year 2021–2023. This report is prepared with the help of real-time data from active and passive surveillances, primary data from different epidemiological studies, and data from outbreak investigations. It will help officers and policymakers in planning and implementing effective strategies for disease prevention and control in the livestock sector.

We want to make our disease reporting system smarter. Now Bangladesh Animal Health Intelligence System (BAHIS) is rolled out in all upazillas. Upazila Livestock Officers were instructed to use BAHIS for the reporting of the surveillance. To increase epidemiological capacity at the field level, we have Deputy Chief Epidemiologists (DCE) at the division level. Involving those DCEs, disease monitoring and reporting capacities have been increased. Sink surveillance in the live bird market (LBM) is being conducted in Dhaka and Chattogram which helps to know the current situation of avian influenza.

The Epidemiology Cell of DLS is capable of responding early to outbreak investigations. Between 2021 and 2023, they conducted 21 outbreak investigations nationwide. These investigations help DLS identify new diseases and control unwanted events within the country.

All the above-mentioned data were collated, analyzed, and interpreted and the information will be used by the field-level officers of DLS and partner organizations for their better understanding of the current disease situation. It also supports the allocation of limited resources and cost-effective management of animal diseases in Bangladesh. The Field Epidemiology Training Programme for Veterinarians (FETPV), funded by GHD|EMPHNET, has helped DLS field veterinarians become more proficient epidemiologists.

The reports provide valuable insights into the current status and trends of animal health and disease in Bangladesh. As we move forward, especially in light of the government's vision, let us remain focused on collaborating to safeguard the well-being of our livestock sector.

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Animal Health Activities Report 2021-2023

Epidemiology Cell
Department of Livestock Services

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Executive summary

The Department of Livestock Services (DLS), in partnership with the Food and Agriculture Organization (FAO), prepare periodical epidemiological reports for animal health. These reports, produced from real-time data and various surveillance programs, aid policymakers and officials in planning and implementing effective strategies for disease prevention and control.

The live bird market (LBM) sink surveillance program, focused on avian influenza, collects monthly samples in Dhaka and Chattogram. A rising prevalence of influenza A since 2019, reaching 61% in 2021. H5 and H9 subtypes exhibit similar patterns, with H9 surpassing H5 between 2019 and 2023. No positive results were observed for H7 subtype.

In terms of farmers applying antibiotics on poultry farms, there was a significant reduction in antibiotic use across all WHO AWaRe categories, particularly in the 'reserve' category, indicating a positive shift towards responsible antibiotic practices.

Among 546 *E. coli* isolates, 95% exhibited resistance to over three antibiotic classes, with 82% resistant to at least five. The most common resistance combination (77%) included 1st gen cephalosporins, fluoroquinolones, and aminopenicillins. Six isolates were susceptible to all classes, and the least resistance was observed to one class.

All the biosecurity practices in the entrance, loading, and production areas and personal and equipment management practices were improved during 2023 compared to the period of 2017 –2022 except “signs posted” (p=0.45) and “changing clothes before entering farm” (p=0.12).

The upazila veterinary hospitals regularly report livestock and poultry disease cases using the Bangladesh Animal Health Intelligence System (BAHIS). Different surveillances were included in the Annual Performance Agreement (APA) which will be effective from 2024. Upazila Livestock Officers were instructed to use BAHIS for the reporting of the surveillance. Eight Deputy Chief Epidemiologists (DCE) are being appointed in all divisions. Disease monitoring and reporting capacities will be increased by involving those DCEs.

Upazila veterinary hospitals also report disease cases using conventional system. According to the report, in 2023, the number of anthrax and rabies cases decreased by 2%, and 23% compared to 2022. On the other hand, foot and mouth disease (FMD) and peste de petis (PPR) cases increased by about 48% and 18%. In poultry, the number of mycoplasma and Newcastle disease cases decreased by 23% and 5%. Only rabies showed a decreasing trend for the last four consecutive years.

The DLS Epidemiology Cell conducted 21 outbreak investigations nationwide from 2021 to 2023. Among them, 10 were in 2023 and identified lead poisoning, PPR and BQ, FMD, LSD, a mixed infection of FMD and HS, and African swine fever at Rangamati. To control LSD, a pilot blanket vaccination campaign was conducted in Chattogram, Dinajpur, and Sirajganj districts. No farmer reported any clinical signs of LSD and adverse reactions in their cattle after vaccination. During the post-vaccination surveillance, 99 LSD cases were identified, with five occurring in vaccinated areas.

To increase the epidemiological ability of the field veterinarian, DLS with funding support GHD|EMPHNET in collaboration with the Chattogram Veterinary and Animal Sciences University (CVASU) implemented the field epidemiology training program for veterinarians (FETPV) in Bangladesh during the reporting period.

The epidemiological reports provide valuable insights into the current status and trends of animal health and disease in Bangladesh. They highlight the achievements and challenges of various surveillance and intervention programs, and suggest the need for continuous monitoring, reporting, and capacity building to ensure effective animal health management.

1. Introduction

This animal health activities report from the Department of Livestock Services (DLS) presents an overview of the epidemiological situation for the livestock priority diseases, monitoring of the poultry farm assessment, and responses to the disease outbreaks from 2021 to 2023.

In the span of these three years, DLS has gathered data, monitored disease trends, and responded to disease outbreaks. The insights derived from this report will be helpful in shaping policies, guiding research, and informing stakeholders at all levels—from farmers to policymakers—about the challenges and achievements in the animal health sector.

DLS has prepared this report with the technical support from FAO ECTAD. This report has been prepared with real-time data from active and passive surveillance, primary data from different epidemiological studies, and data from outbreak investigations. All the above-mentioned data were collated, analyzed and interpreted and the information will be used for the field-level officers of DLS and partner organizations for their better understanding of the current disease situation, to support the allocation of limited resources of the country and manage the animal diseases in a cost-effective manner.

2. Surveillance

2.1 Active Surveillance

2.1.1. Live bird market (LBM) sink surveillance for avian influenza

The LBM sink surveillance programme for monitoring H5N1 highly pathogenic avian influenza (HPAI) and detecting novel influenza viruses continued monthly sampling from 106 and 70 medium and large-sized LBMs in Dhaka and Chattogram, respectively. Environmental samples were taken by FAO-trained Market Environmental Surveillance Officers (MESOs) within the DLS and the municipal human health service.

2.1.1.1. Surveillance by year, 2016-2023

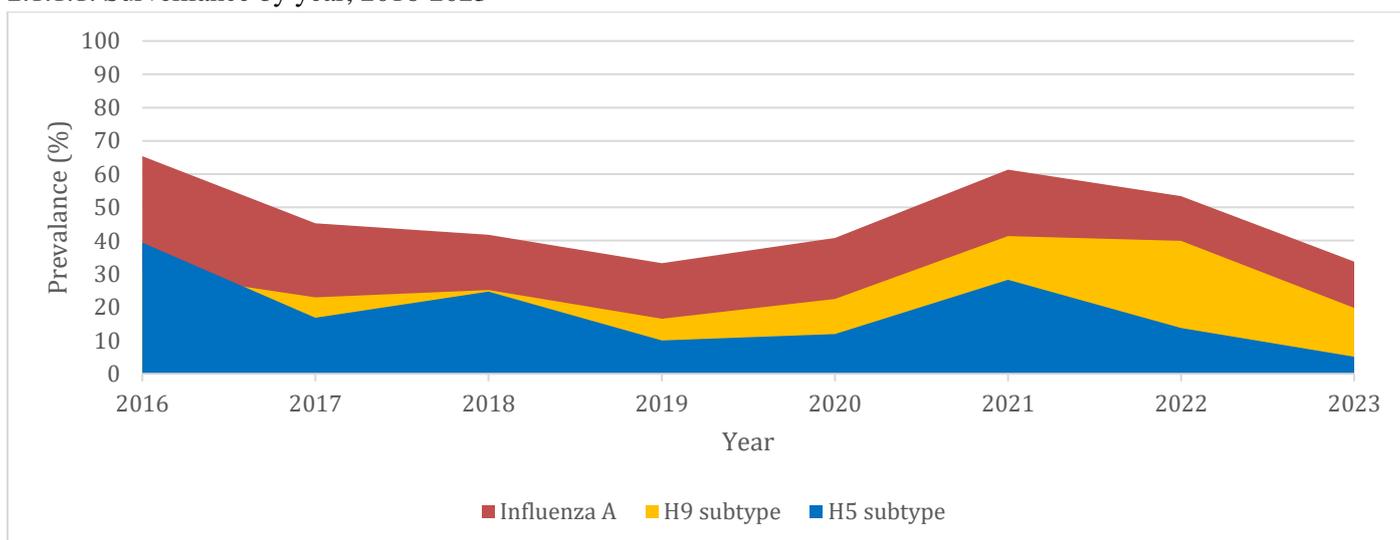


Figure 1: Annual prevalence of influenza A, H5, and H9 subtype in LBMs between 2016 and 2023

Since the sink surveillance programme inception in Dhaka in 2016 and in Chattogram in 2017, a total of 15,814 pooled samples were collected from LBMs and tested by real-time PCR for influenza A. Influenza A (Matrix gene) positive samples were tested for H5, H7, and H9 subtypes by real-time PCR. The prevalence of influenza A has been increasing since 2019 and reached 61% in 2021. Similar to the prevalence of influenza A, the prevalence of H5 and H9 subtypes

also showed an increasing pattern after 2019. The prevalence of H9 subtype was higher than that of H5 subtype between 2019 and 2023. No positive test result was observed for H7 subtype.

2.1.1.2. Surveillance by month, 2020-2023

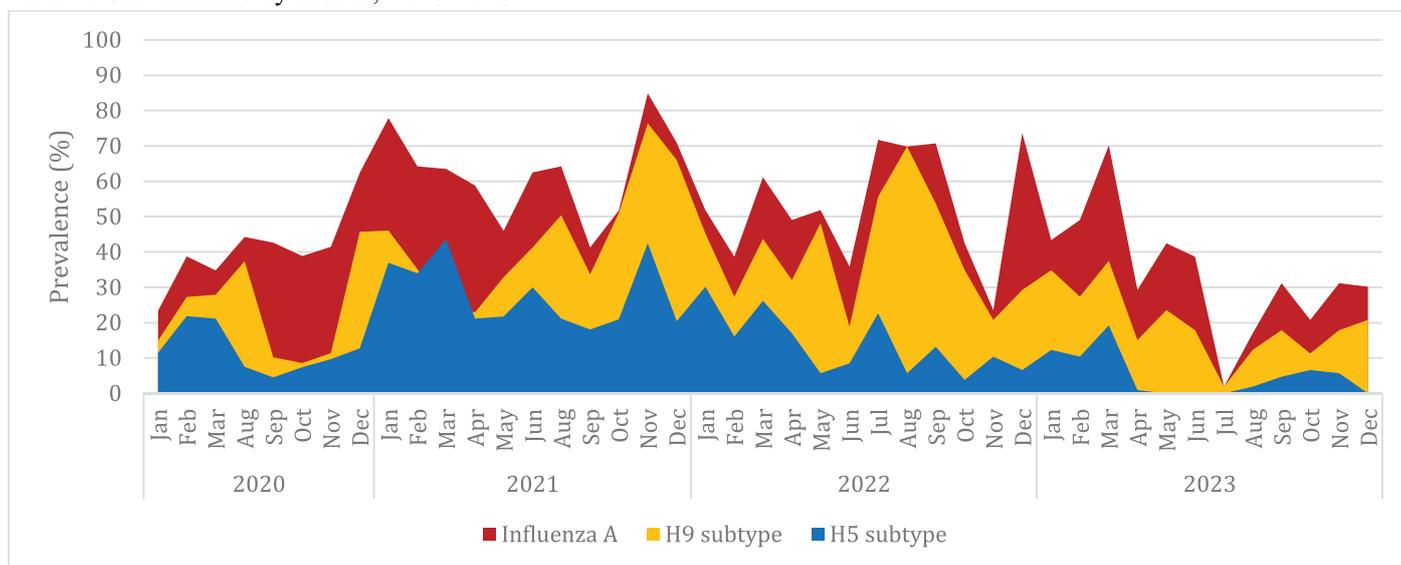


Figure 2: Monthly prevalence of influenza A, H5, and H9 subtypes in LBMs between 2020 and 2023

The surveillance results illustrated that the prevalence of influenza A between November to February was generally higher than that of the other months. The prevalence of H9 subtype throughout the period was always higher than that of H5, except for March 2021.

2.1.1.3. Surveillance result by LBM sampling zone

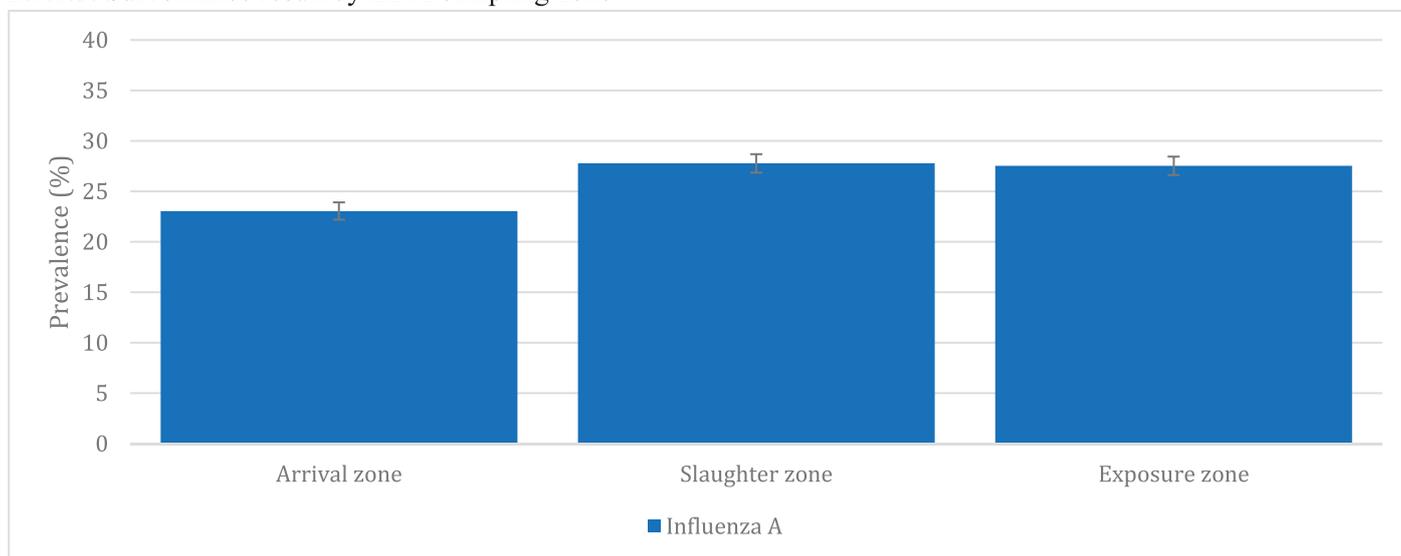


Figure 3: Prevalence of influenza A by LBM sampling zone, 2016-2023

The prevalence of influenza A in the slaughter and exposure zones was higher than in the arrival zone. This suggests that poultry arrived with the influenza virus at LBMs and then the virus was amplified further at the markets while birds were passing slaughter and exposure zones.

2.1.2. Comparative antibiotics usage monitoring on poultry farms

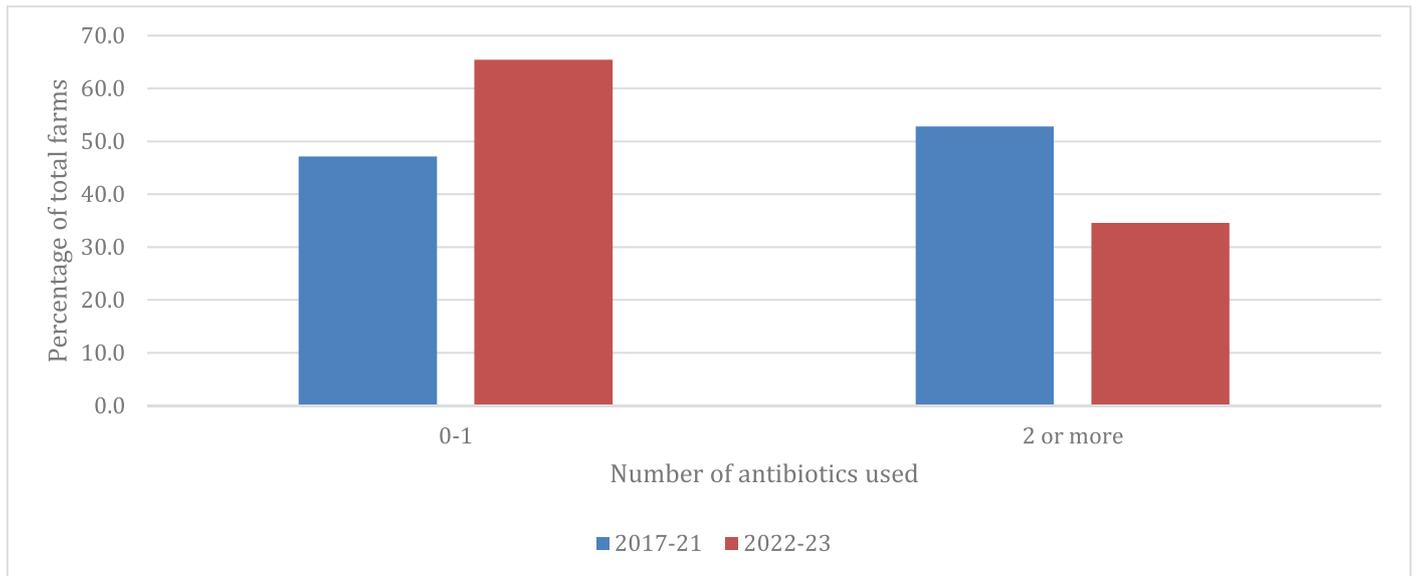


Figure 4: Percentage of poultry farms in upazila using different numbers of antibiotics, 2017-2021 and 2022-2023

From figure 4, it was found that a decrease in the percentage of farms using multiple antibiotics (two or more) from 2017-2021 to 2022-2023. In contrast, there was an increase in the percentage of farms using no or only one type of antibiotics during the same period.

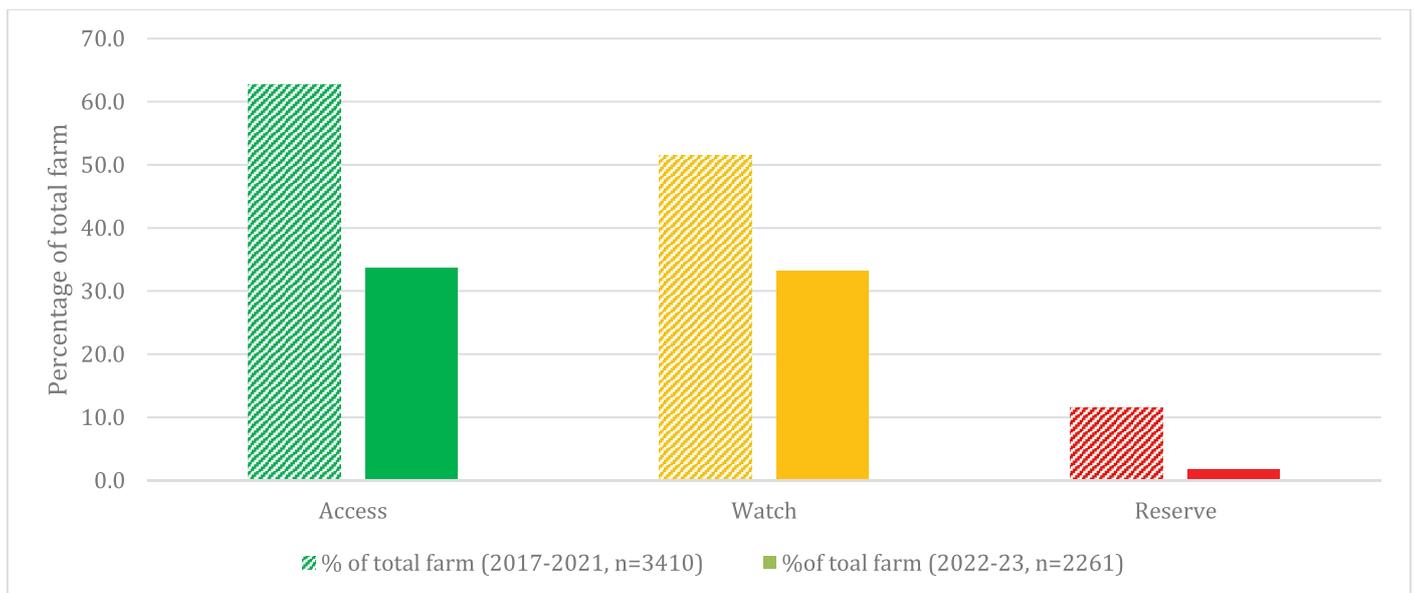


Figure 5: Percentage of poultry farms in U2C districts that use antibiotics grouped by the WHO AWaRe classification, 2017-2023

- * Access group: Antibiotics are listed as first and second choice for the empirical treatment of common infectious syndromes
- ** Watch group: Antibiotic with higher resistance potential. Use as first or second choice treatment should be limited to selected infections.
- *** Reserve group: Antibiotics to be used as “last-resort” treatment options for multi-drug resistance infections.

The percentage of farms reporting the use of antibiotics in all three groups of WHO AWaRe classification significantly decreased during 2023 compared to the period of 2017 –2021. Among the AWaRe categories, ‘reserve’ category antibiotics found less used in the reporting period.

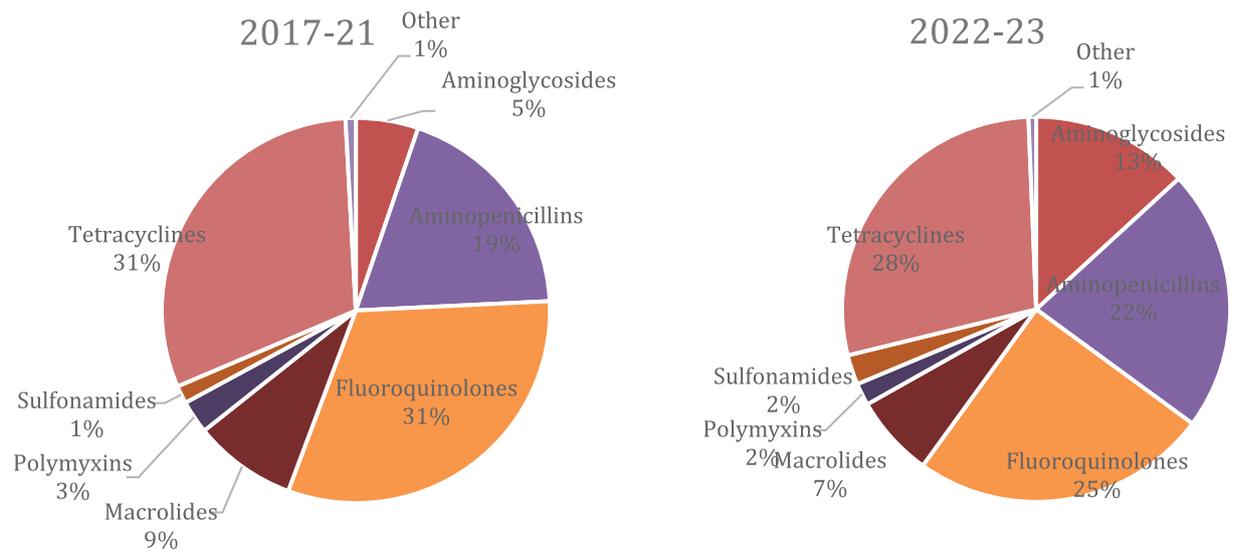


Figure 6: Proportion of antibiotic class documented via poultry farm assessment during the period of 2017-2023

Fluoroquinolones, tetracyclines, and aminopenicillins were the most commonly reported antibiotic classes used on poultry farms during 2022-23.

2.1.3. Antimicrobial resistance (AMR) monitoring in poultry *E. coli*

The sink surveillance for antimicrobial resistance collected a total of 533 chicken caeca from the LBMs in Dhaka in from 2021 to 2023. Antimicrobial susceptibility testing (AST) was conducted for *E. coli* isolates against 19 antibiotics: amoxicillin, ampicillin, azithromycin, cefazolin, cefotaxime, cefoxitin, ceftazidime, chloramphenicol, ciprofloxacin, colistin, gentamicin, imipenem, meropenem, nalidixic acid, nitrofurantoin, sulphonamide, tetracycline, tigecycline, and trimethoprim.

2.1.3.1. Antimicrobial resistance surveillance in poultry *E. coli* results

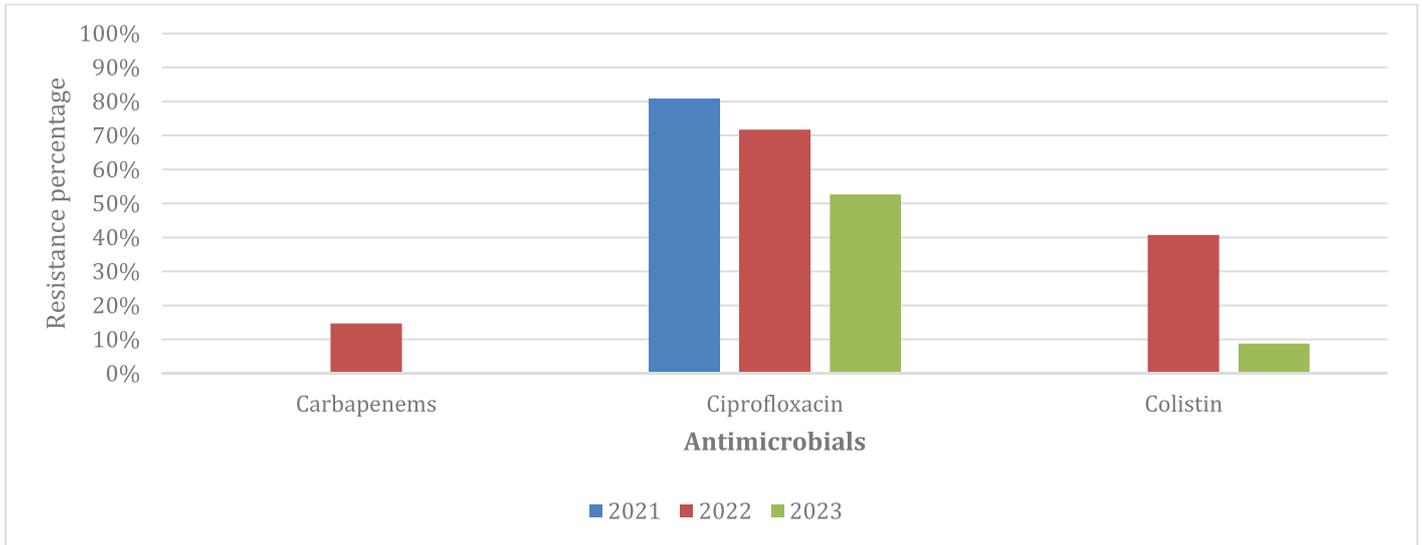


Figure 7: Percentage of *E. coli* isolates with antimicrobial resistance to carbapenems, ciprofloxacin, and colistin.

* The carbapenems result indicates the combination of imipenem and meropenem test results.

The percentage of isolates resistant to ciprofloxacin and colistin between 2021-2023 showed a decreasing trend of resistance. None of the isolates showed resistance against meropenem from 2021 to 2023. Imipenem was reported as having 15% of resistance in 2022.

2.1.3.2. Antimicrobial resistance surveillance results by WHO AWaRe classification

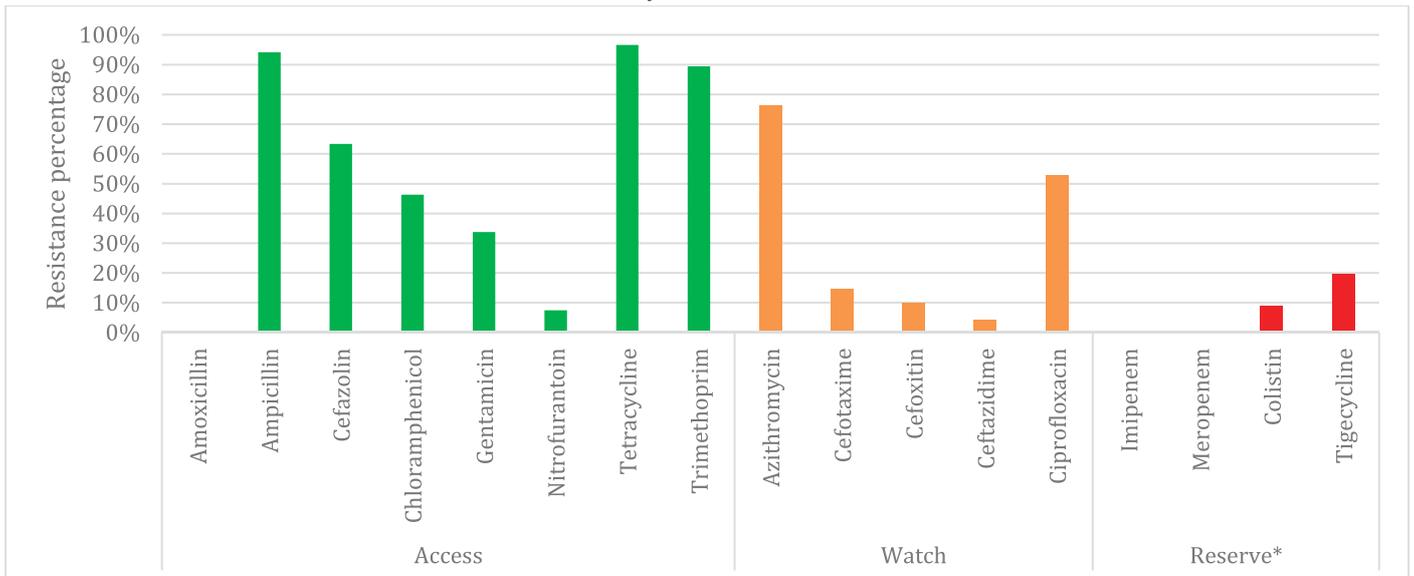


Figure 8: Percentage of resistance to antibiotics in *E. coli* isolates from slaughtered chickens in LBMs according to WHO AWaRe classification between 2021-2023

* Meropenem and imipenem are considered as reserve when they are in combination with vaborbactam, and cilastatin and relebactam respectively

The percentage of antimicrobial resistance was generally higher in order of Access, Watch, and Reserve group. Ampicillin, Tetracycline, and Trimethoprim belong to the access group, showed higher antimicrobial resistance rates (> about 90%), but the antimicrobial resistance rates of cefazolin (37%), gentamicin (34%), and nitrofurantoin (7%) were relatively low. Three antibiotic agents in the watch group recorded lower antimicrobial resistance rates, lower than 40% but, azithromycin and ciprofloxacin recorded higher antimicrobial resistance rates, similar to the access group, 76% and 46%, respectively. Colistin and tigecycline in the reserve group reported antimicrobial resistance of 9% and 20% respectively.

2.1.3.3. Multi-antimicrobial resistance

Antibiotics used for AST belong to 15 different antibiotic classes. Specifically, it includes aminopenicillins [ampicillin, amoxicillin], first-generation cephalosporins [cefazolin], Cephameycin [cefoxitin], third-generation cephalosporins [cefotaxime, ceftazidime], Macrolides [azithromycin], Polymyxins [colistin], Sulphonamide, Tetracyclines [tetracycline], Carbapenems [imipenem, meropenem], Fluoroquinolones [ciprofloxacin, Nalidixic acid], Aminoglycosides [gentamicin], chloramphenicol, nitrofurantoin, trimethoprim, and tigecycline.

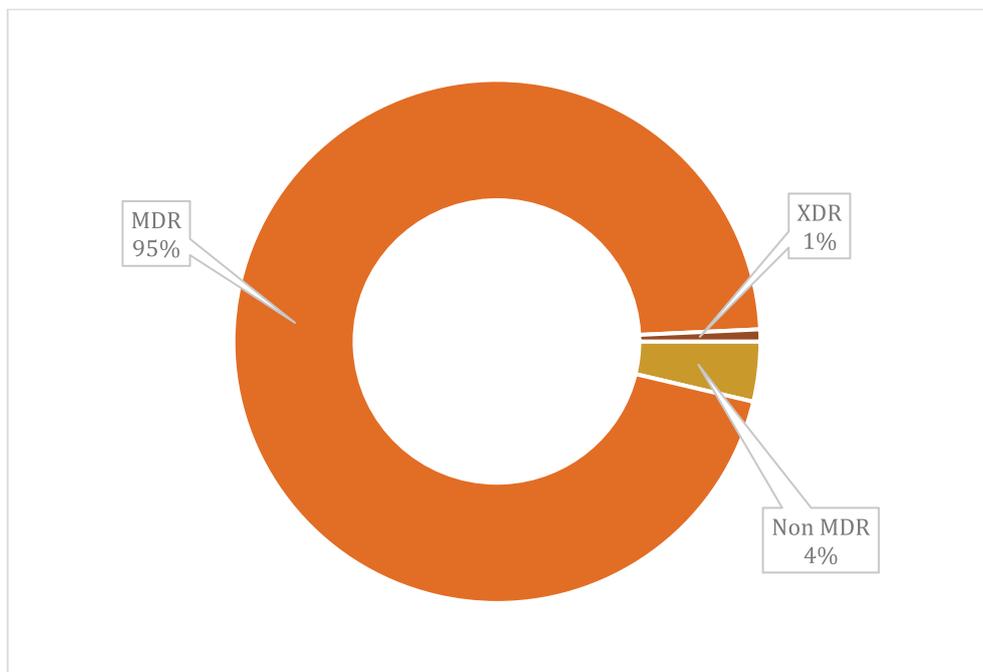


Figure 9: Percentage of acquired antibiotic resistance profiles, 2021-2023

- * Multidrug-resistant (MDR): acquired non-susceptibility to at least one agent in three or more antimicrobial classes
- * Extensively drug-resistant (XDR): non-susceptibility to at least one agent in all but two or fewer antimicrobial classes
- * Pandrug-resistant (PDR): non-susceptibility to all agents in all antimicrobial classes

For 265 *E. coli* isolates collected from slaughtered chicken caeca in LBMs in 2023, AST against 17 antibiotics classes was fully applied. The AST result showed that 95 percent of isolates were resistant to more than three antibiotic classes. The rest of the isolates (5%) showed less than two antibiotic classes (non-MDR).

Antibiotics class	Non MDR		MDR										XDR		PDR	Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Nitrofurantoin	0	0	0	0	0	2	2	1	6	2	4	2	0	0	0	19
Carbapenems	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cephameycin	0	0	0	1	1	1	1	5	8	1	6	2	0	0	0	26
Aminoglycosides	0	0	0	0	3	1	6	27	25	7	9	2	0	0	0	80
Polymyxins	0	0	0	0	3	1	3	3	2	3	5	1	0	0	0	21
Tigecycline	0	0	0	1	0	2	4	10	18	4	6	2	0	0	0	47
Chloramphenicol	0	0	0	4	9	6	21	34	26	7	9	2	0	0	0	118
Third-generation cephalosporins	0	2	0	1	1	2	5	5	4	4	6	1	0	0	0	31
Macrolides	0	0	5	8	59	22	20	35	25	7	9	2	0	0	0	192
Sulphonamide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fluoroquinolones	1	0	5	26	70	24	22	35	27	7	9	2	0	0	0	228
Trimethoprim	0	2	9	30	71	23	22	35	27	7	9	2	0	0	0	237
Aminopenicillins	3	4	9	35	69	22	20	35	27	7	9	2	0	0	0	242
First-generation cephalosporins	0	0	3	3	6	14	12	20	21	7	9	2	0	0	0	97
Tetracyclines	1	6	14	35	73	24	23	35	27	7	9	2	0	0	0	256
Total number of isolates	5	7	15	36	73	24	23	35	27	7	9	2	0	0	0	

Table 1. Number of antibiotic classes that *E. coli* isolates are resistant to and the number of *E. coli* isolates resistant to each class of antibiotic, 2021-2023. Combinations of the number of antibiotic classes that the isolate is resistant to and antibiotic class were coloured green to red according to the frequencies of findings.

AST results showed that most of the isolates (95%) have resistance to more than three antibiotic classes, while 82% of total isolates have resistance to at least five antibiotic classes. Among the 82% of isolates resistant to at least five antibiotic classes, combined resistance to tetracyclines, aminopenicillins, trimethoprim, and fluoroquinolones was the commonly observed combination, accounting for 77%.

There were six isolates susceptible to all antibiotic classes tested.

2.1.4. Biosecurity practices at commercial poultry farms

Figures 10-13 illustrate the percentages of total farms that followed biosecurity practices between 2017 and 2023. There is evidence that all biosecurity practices in the entrance, loading, and production areas and personal and equipment management practices were improved during 2023 compared to the period of 2017 –2022.

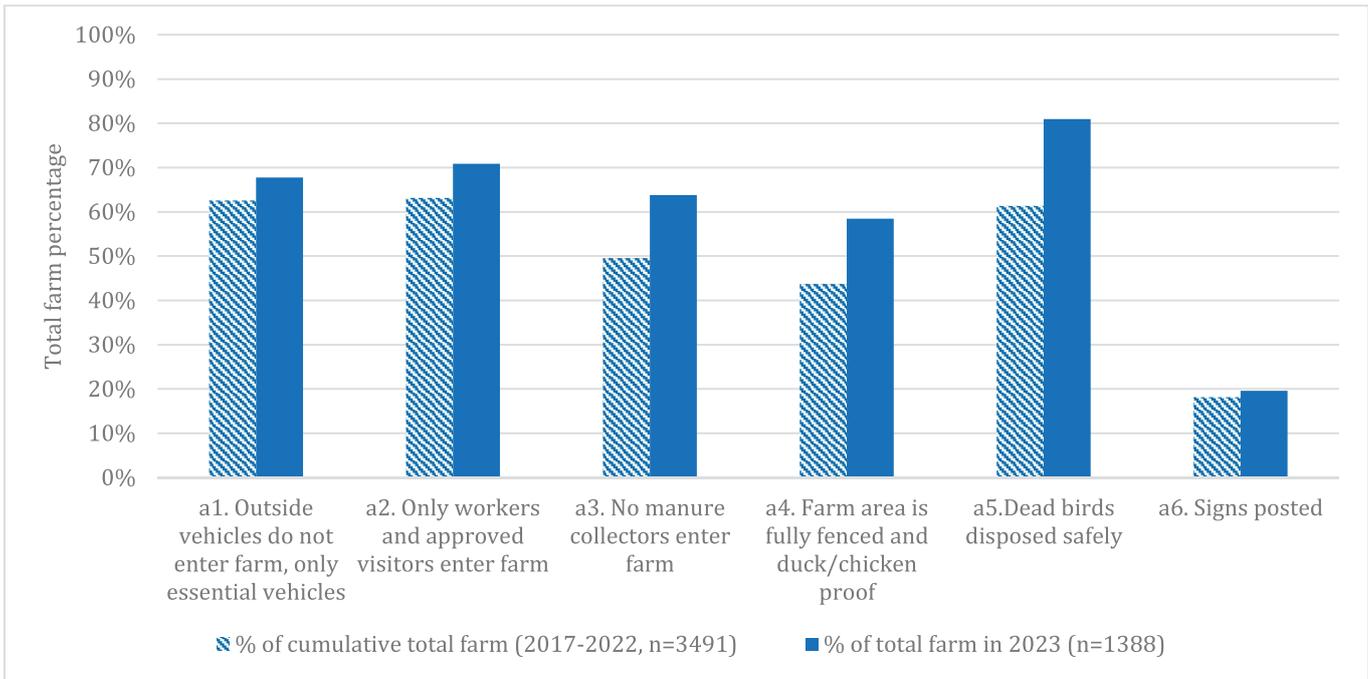


Figure 10: Access control at farm entrance practices reported in poultry farms

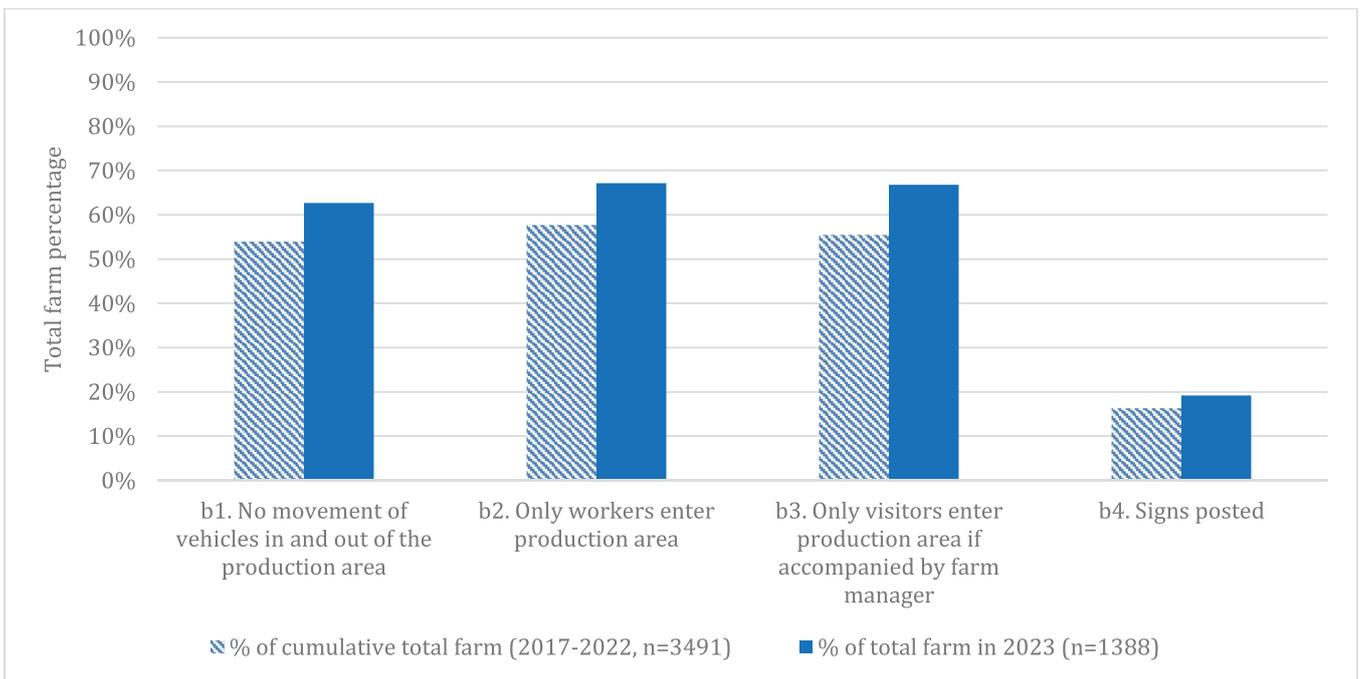


Figure 11: Access control between loading area and production area practices in poultry farms

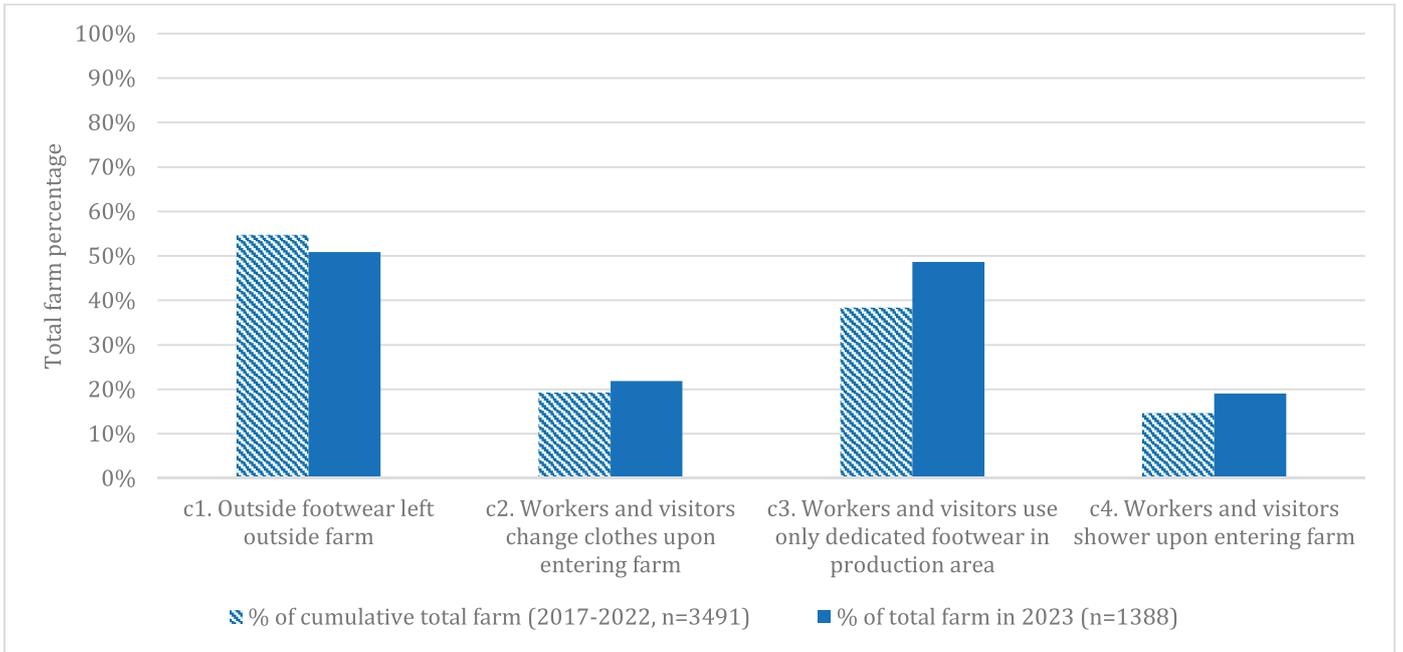


Figure 12: Personnel management practices reported in poultry farms

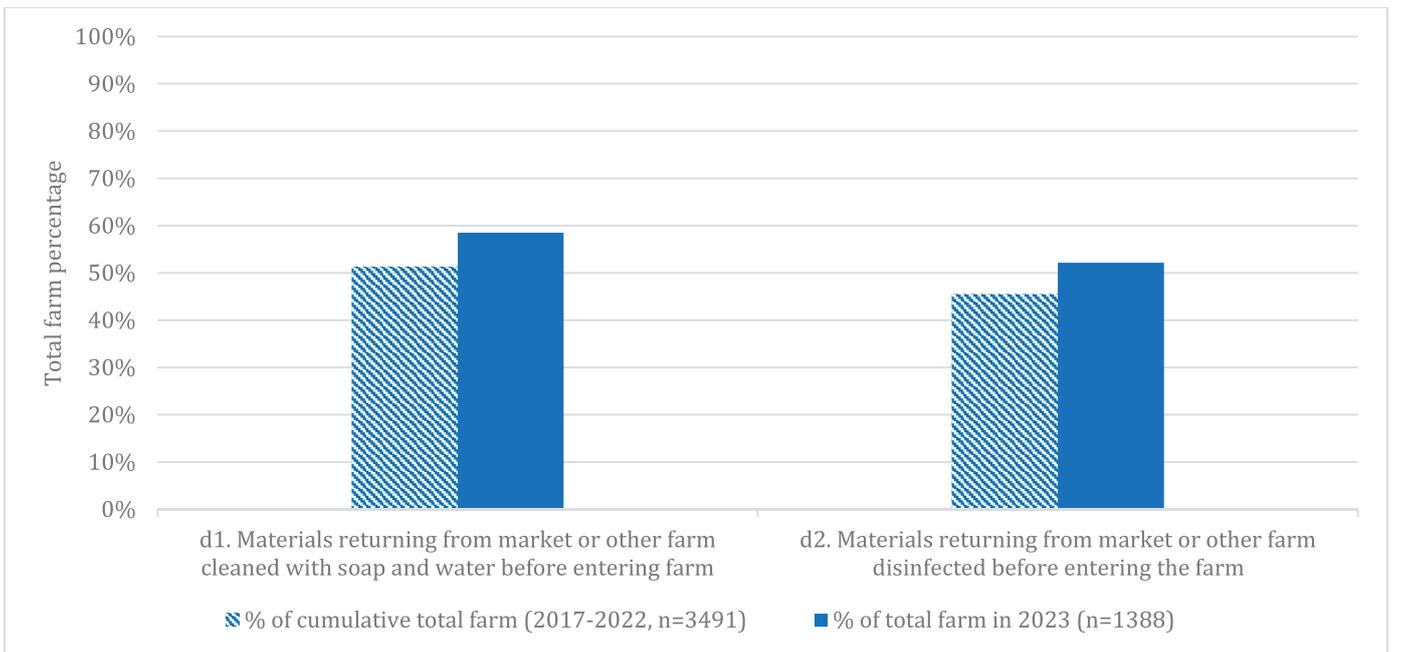


Figure 13: Equipment management practices reported in poultry farms

According to the report, all the biosecurity indicators have been significantly improved except “signs posted” ($p=0.45$) and “changing clothes before entering farm” ($p=0.12$).

2.2. Passive surveillance

DLS uses two reporting systems simultaneously to collect disease information, one is through the Bangladesh Animal Health Intelligence System (BAHIS), the digitalized information management system for livestock, and the other one is conventional routine reporting.

2.2.1. Reporting through BAHIS:

BAHIS was developed for the DLS in 2019 with funding from USAID and technical support from FAO's Emergency Centre for Transboundary Animal Diseases. Currently, BAHIS provides patient registry, event investigation, biosecurity assessments, and environmental surveillance modules, demonstrating a wide range of applications. It is gradually being deployed in all 495 upazila livestock offices. The following figure demonstrates the trend of report submissions over time.

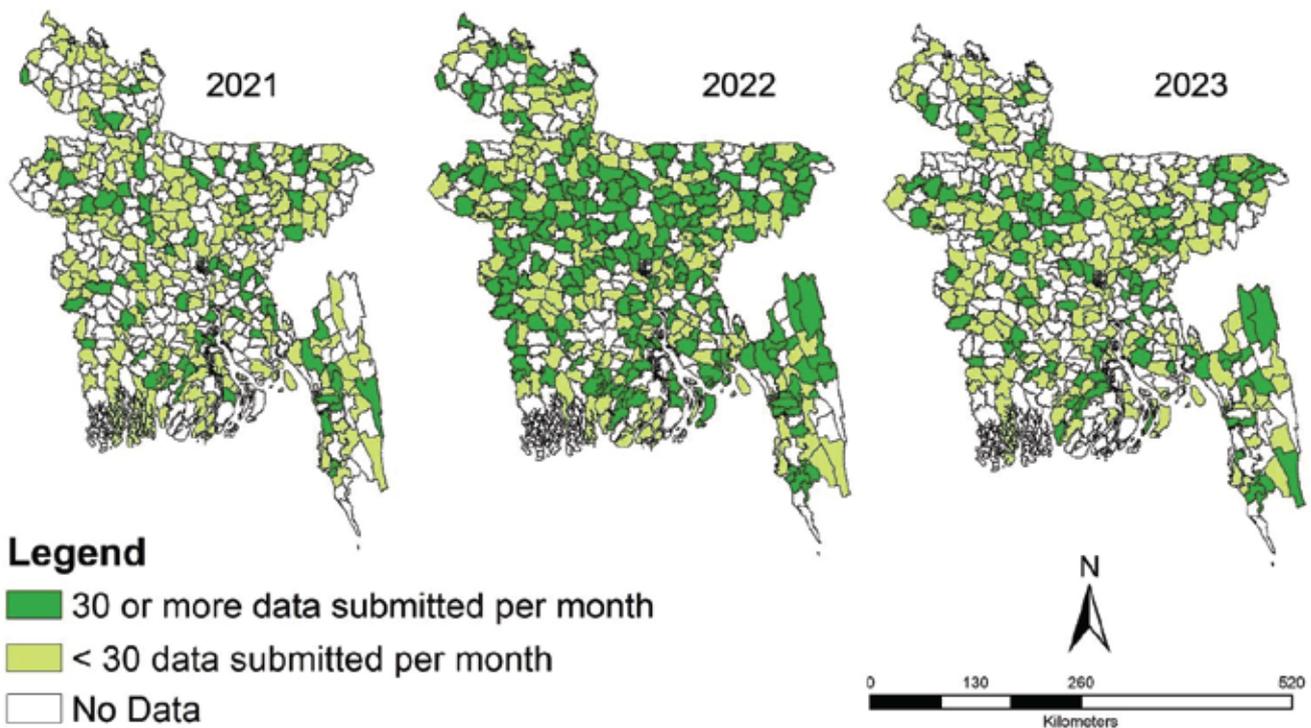


Figure 14: Reporting coverage over the time

In 2021, 53% of the upazilas reported through BAHIS. Reporting was increased (73%) in 2022 followed by the rollout training of BAHIS v2.0. However, reporting was decreased (58%) in 2023 probably due to BAHIS was not included in the APA. However, livestock and poultry disease surveillance and farm assessments as well as hatcheries and feed mills assessments were included in the APA which will be effective from 2024. Upazila hospitals were instructed to use BAHIS for these surveillance and assessment reports. Additionally, six out of eight Deputy Chief Epidemiologists (DCE) were appointed in the divisions. They are monitoring surveillance as well as report submissions. Besides the reporting through BAHIS, disease reporting was continued using a conventional reporting system.

2.2.2. Reporting through conventional system:

Upazila veterinary hospitals routinely recorded the disease cases as a part of disease surveillance. The Upazila offices report the surveillance data to districts monthly, and subsequently districts to divisions and finally move forward to the Epidemiology Cell of the Department of Livestock Service (DLS). The disease diagnosis is based on tentative diagnosis and is not confirmed by any laboratory diagnosis.

2.2.2.1. Foot and mouth disease (FMD)

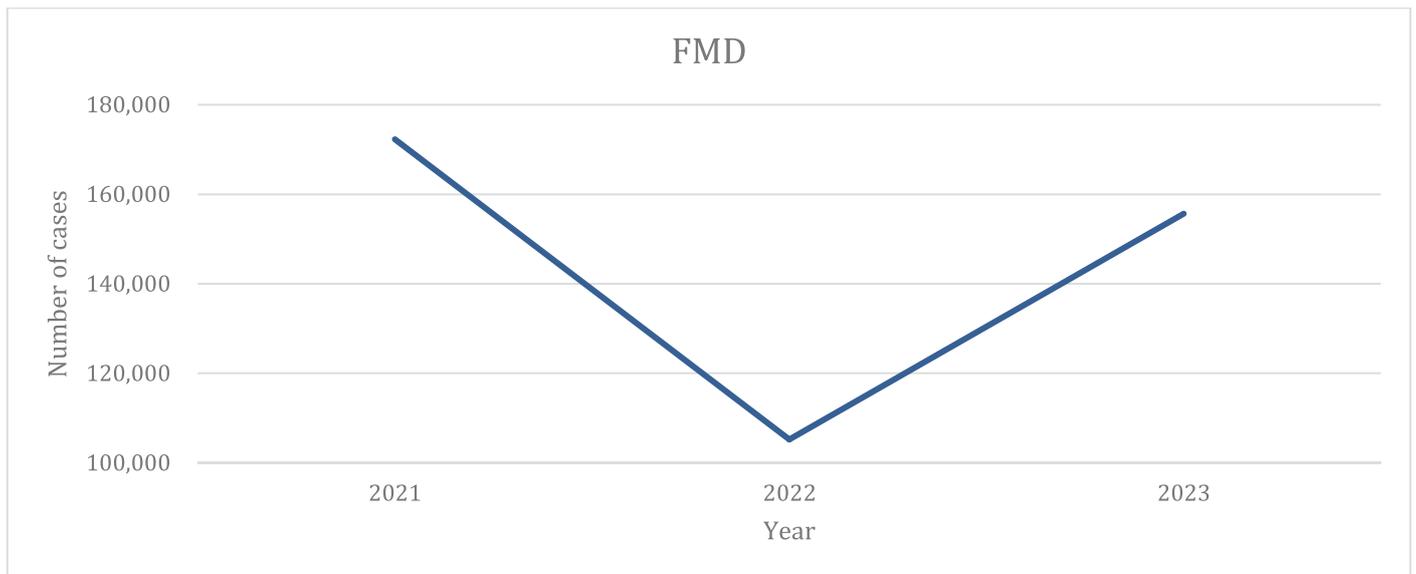


Figure 15: Number of reported foot and mouth disease cases by year, 2021- 2023

A total of 172,268, 105,208 and 155,651 foot and mouth disease (FMD) cases were reported in 2021, 2022, and 2023, respectively. The number of FMD cases decreased by about 39% in 2022, compared to 2021 while the number of cases increased by 48% in 2023, compared to 2022.

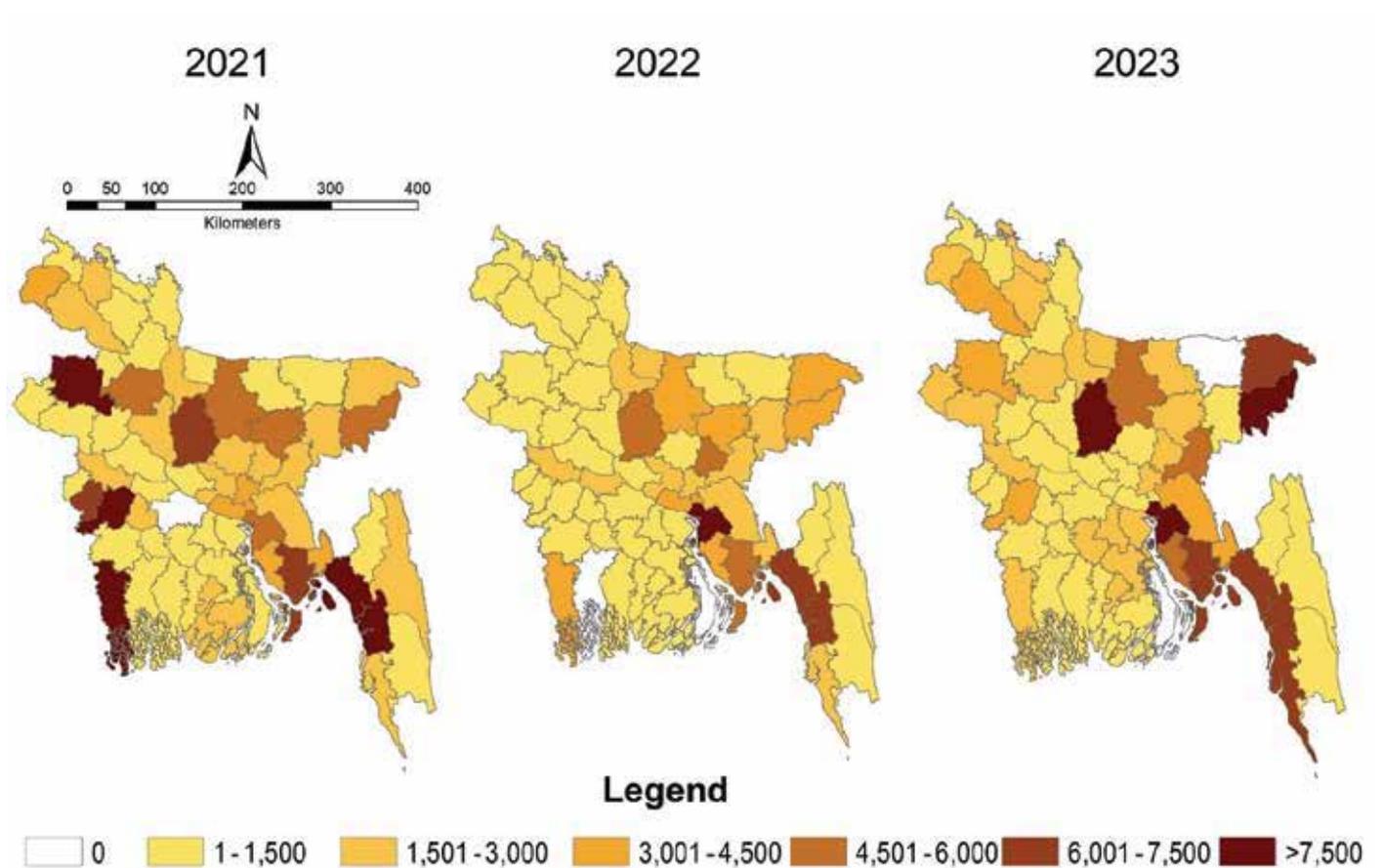


Figure 16: Geographical distribution of foot and mouth disease by year, 2021 – 2023

FMD is endemic in Bangladesh and FMD cases were reported from almost all the districts from 2021 to 2023. A large number of FMD cases were moving west side to the east side of Bangladesh from 2021 to 2023.

2.2.2.2. Peste des petis ruminant (PPR)

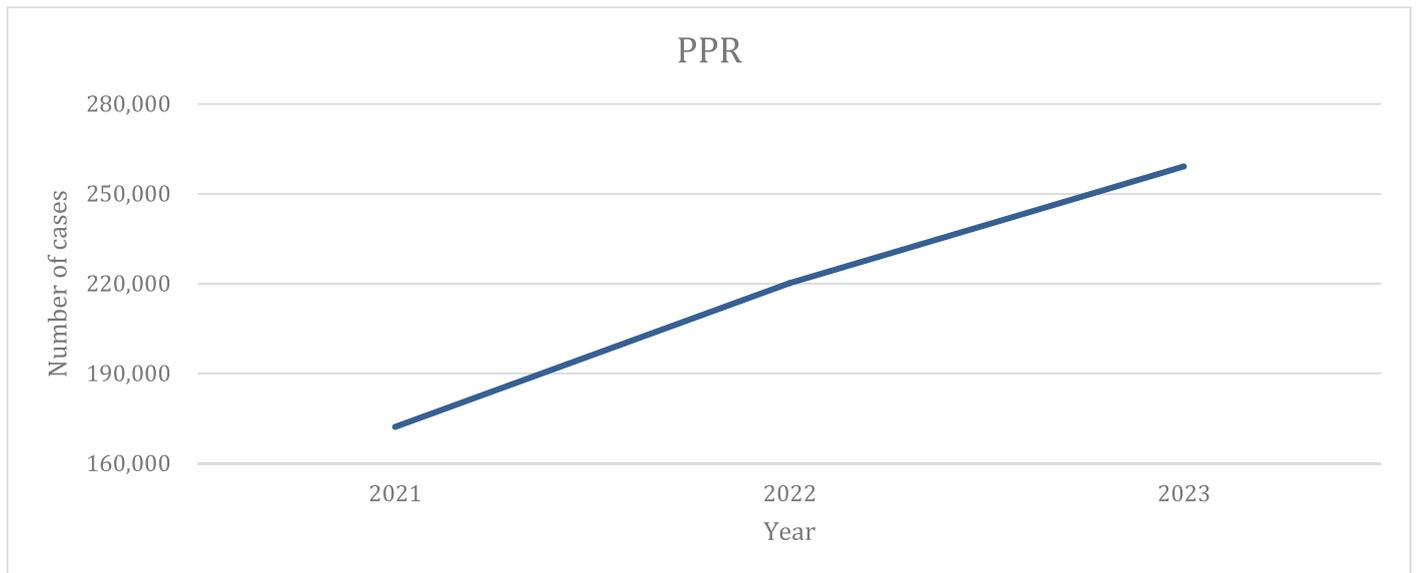


Figure 17: Number of reported peste des petis cases by year, 2021 - 2023

A total of 172,179, 220,181, and 259,147 peste des petis (PPR) cases were reported in 2021, 2022, and 2023, respectively. PPR cases increased by 28% in 2022, compared to 2021, and also increased by 18% in 2023, compared to 2022, meaning the number of cases is on the rise.

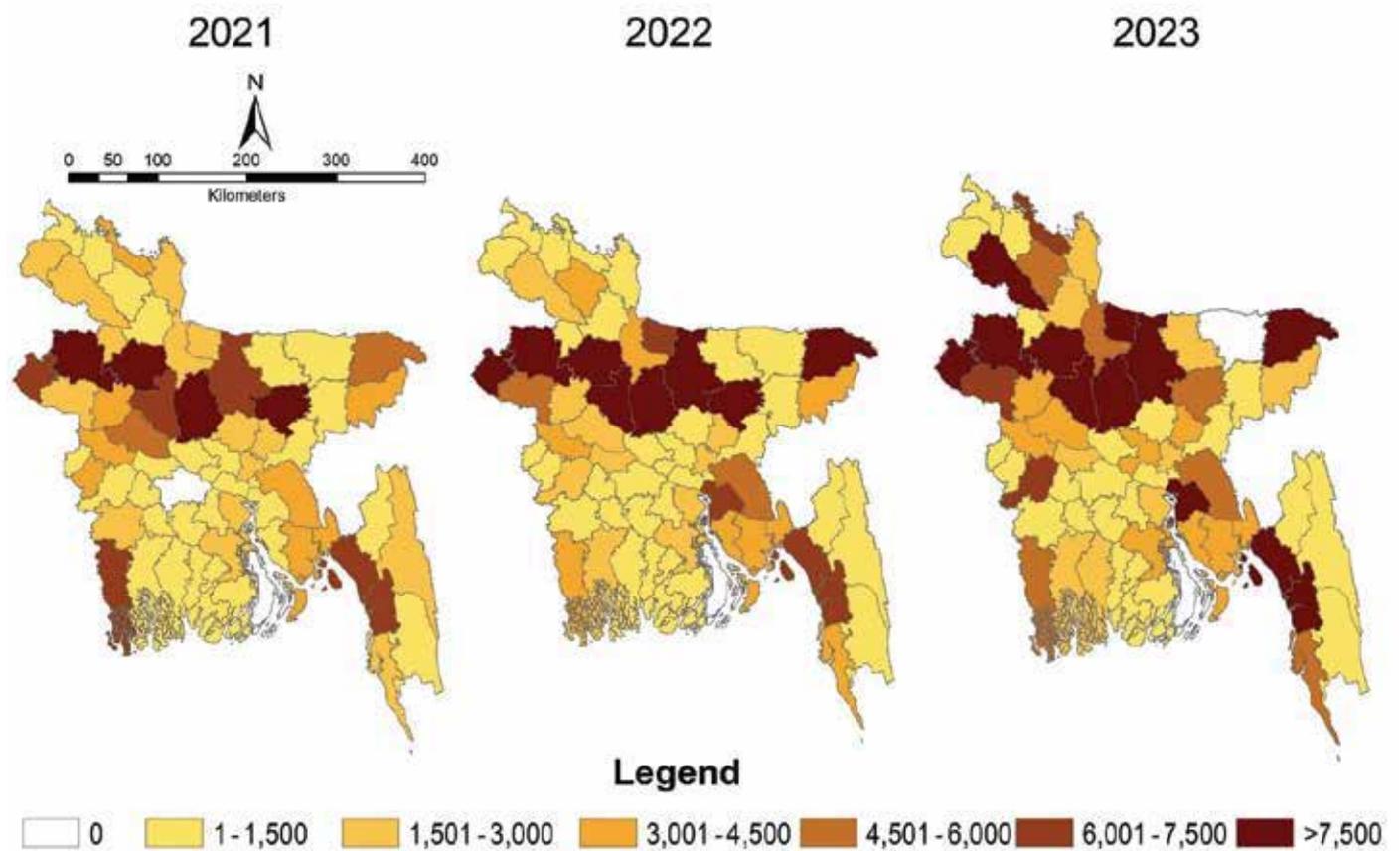


Figure 18: Geographical distribution of peste des petis by year, 2021- 2023

PPR is widely spread in Bangladesh and PPR cases were reported in almost all districts from 2021 to 2023. More PPR cases were reported in the northern part of Bangladesh.

2.2.2.3. Anthrax

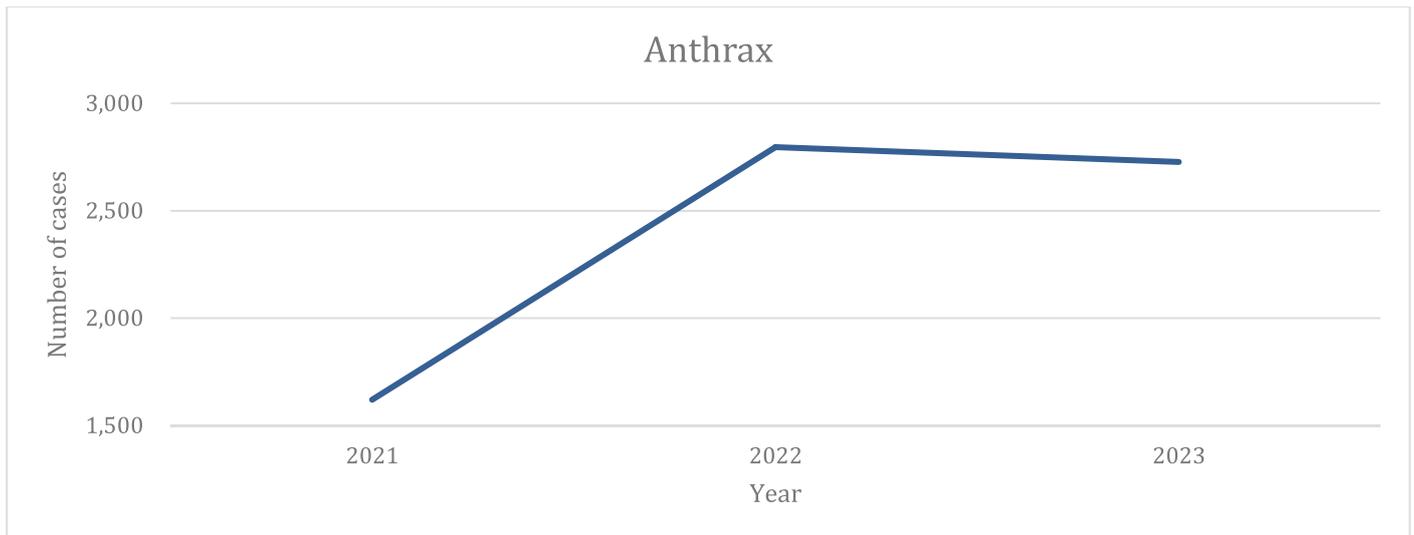


Figure 19: Number of reported anthrax cases by year, 2021 - 2023

A total of 1,620, 2,796 and 2,727 anthrax cases were reported in 2021, 2022, and 2023, respectively. The number of anthrax cases increased by 73% in 2022, compared to 2021 while the number of anthrax cases decreased by 2% in 2023, compared to 2022.

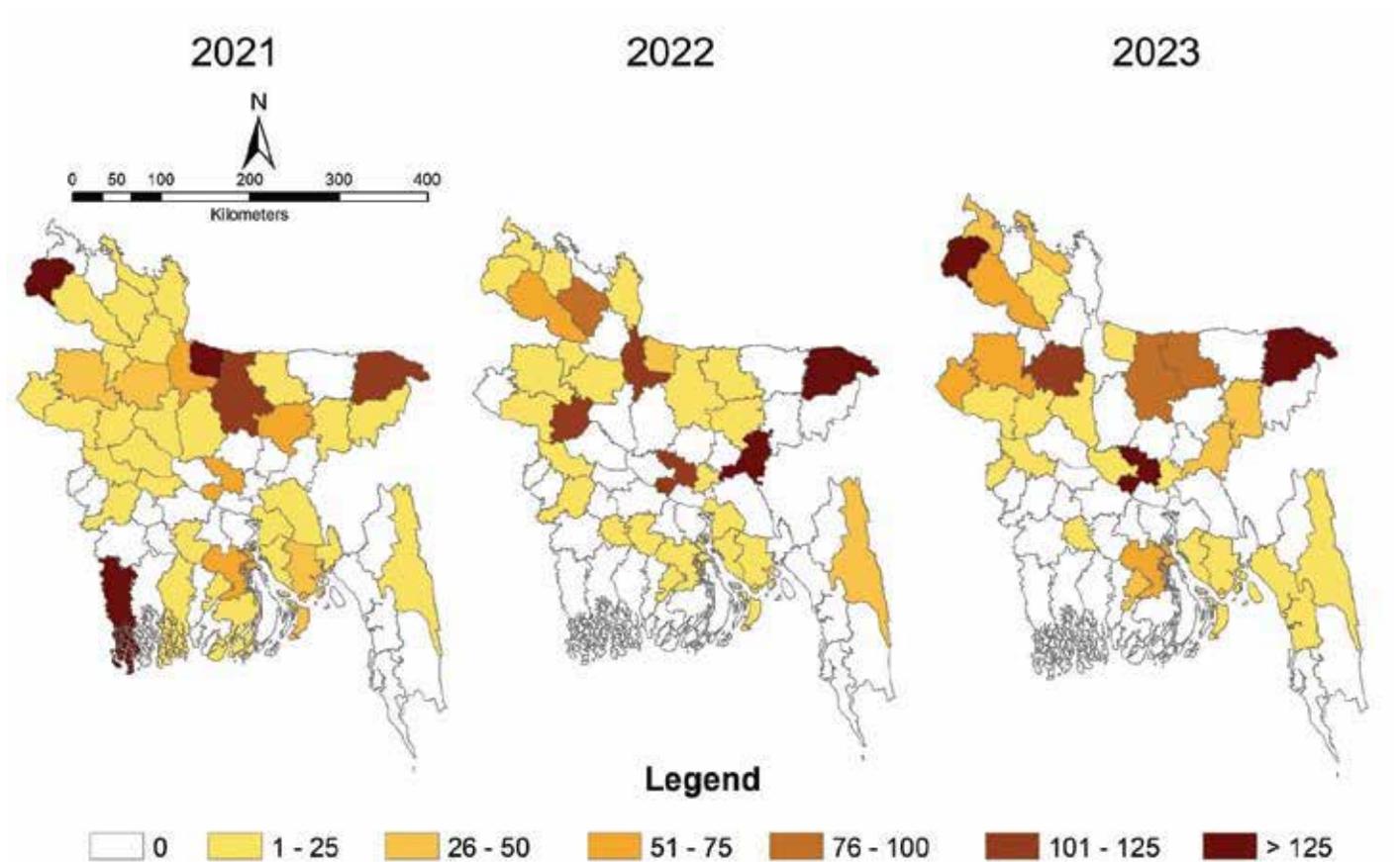


Figure 20: Geographical distribution of anthrax cases by year, 2021 - 2023

Anthrax cases have not been distributed to all districts in Bangladesh. Most anthrax cases were reported in Mymensingh, Sylhet, and Chattogram in 2020, Rajshahi, Mymensingh, and Satkhira reported the most anthrax cases in 2021 while Sylhet and Dhaka reported the most anthrax in 2023.

2.2.2.4. Rabies

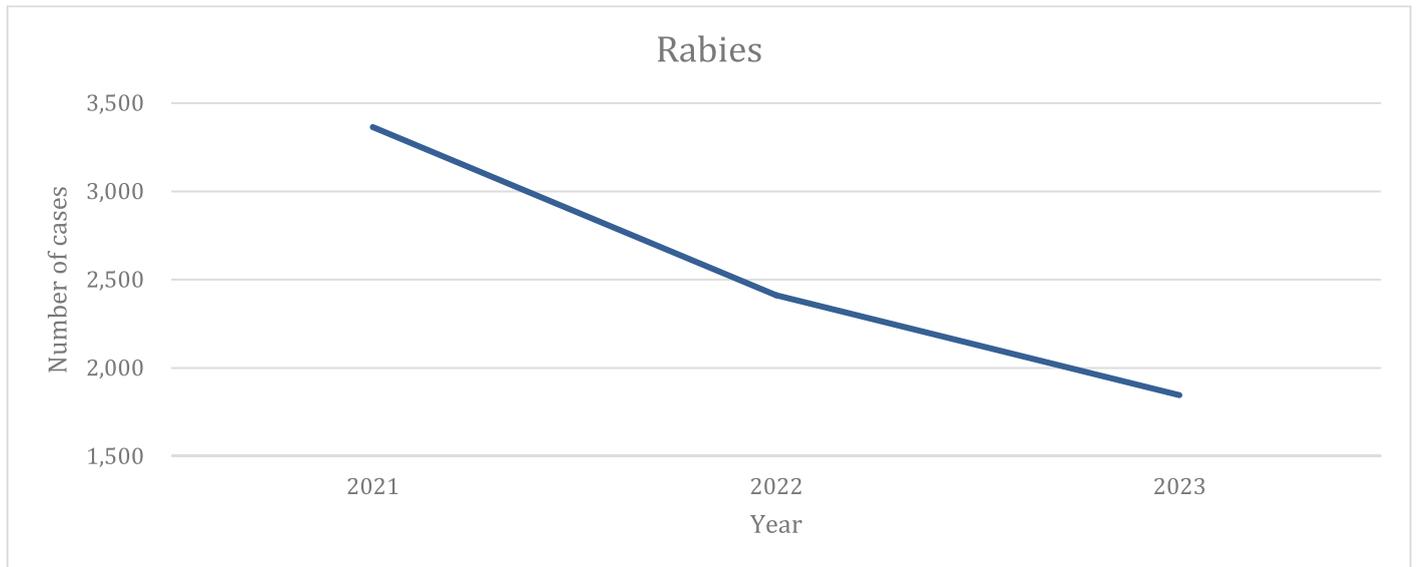


Figure 21: Number of reported rabies cases by year, 2021 - 2023

A total of 3,364, 2,412 and 1,846 rabies cases were reported in 2021, 2022, and 2023, respectively. The number of rabies cases decreased by 28% in 2022, compared to 2021, and decreased by 23% in 2023, compared to 2022 indicating a decreasing trend.

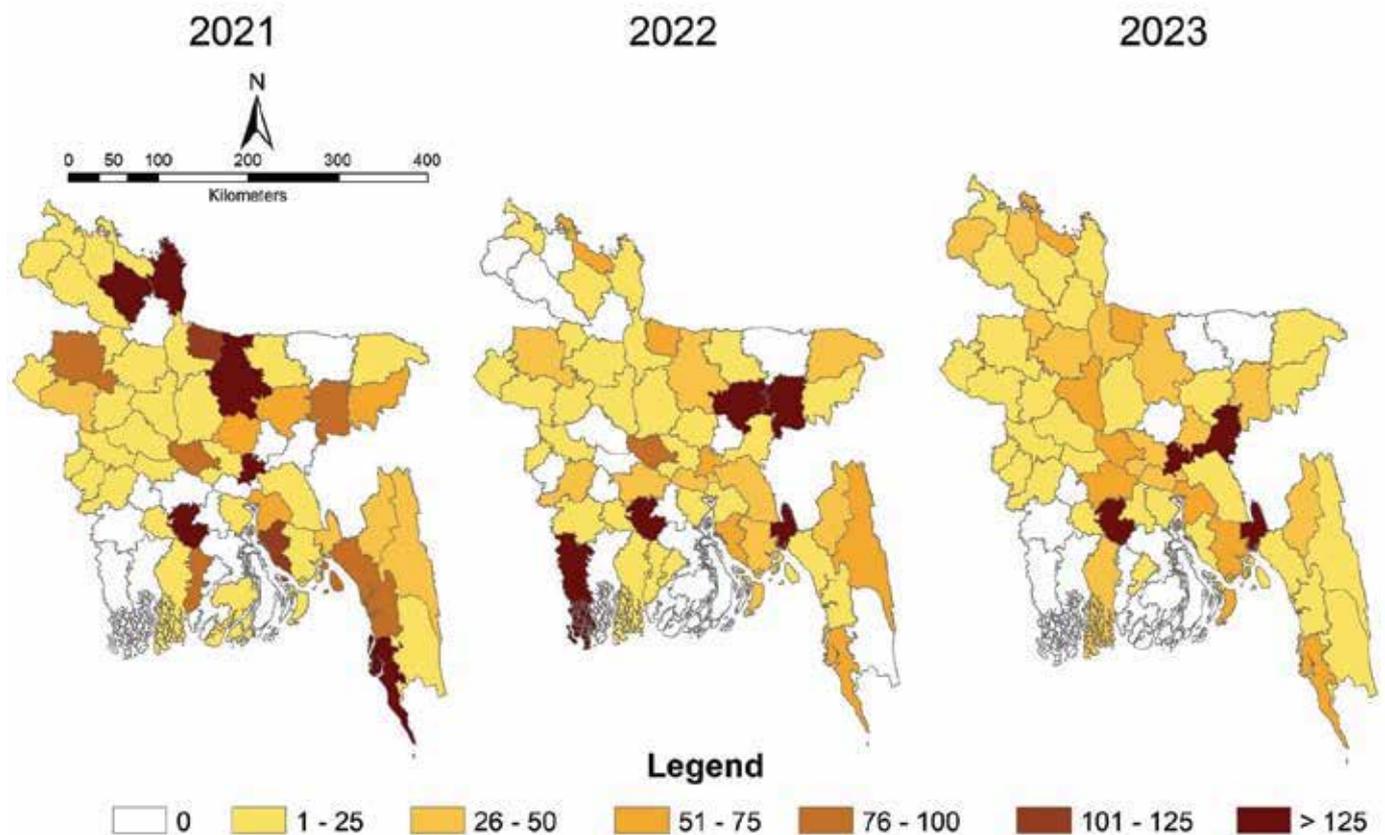


Figure 22: Geographical distribution of rabies by year, 2021- 2023

Rabies cases were reported in almost all districts in Bangladesh and in Barisal no rabies case was reported and most cases were reported in Feni, Narayanganj, Brahmanbaria, and Gopalganj in 2023

2.2.2.5. Mycoplasma

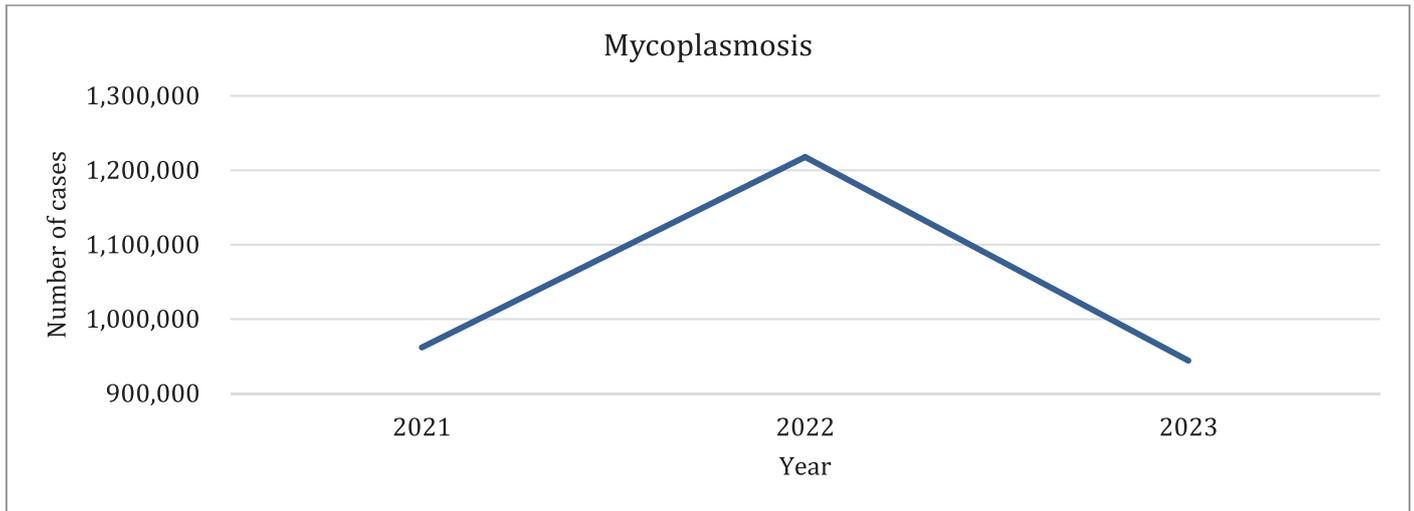


Figure 23: Number of reported mycoplasma cases by year, 2021 - 2023

A total of 8,961,852, 1,217,774, and 944,146 mycoplasma cases were reported in 2021, 2022, and 2023 respectively. The number of mycoplasma cases increased by 26% in 2022, compared to 2021, while the number of mycoplasma cases decreased in 2023 by 23% in 2023, compared to 2022.

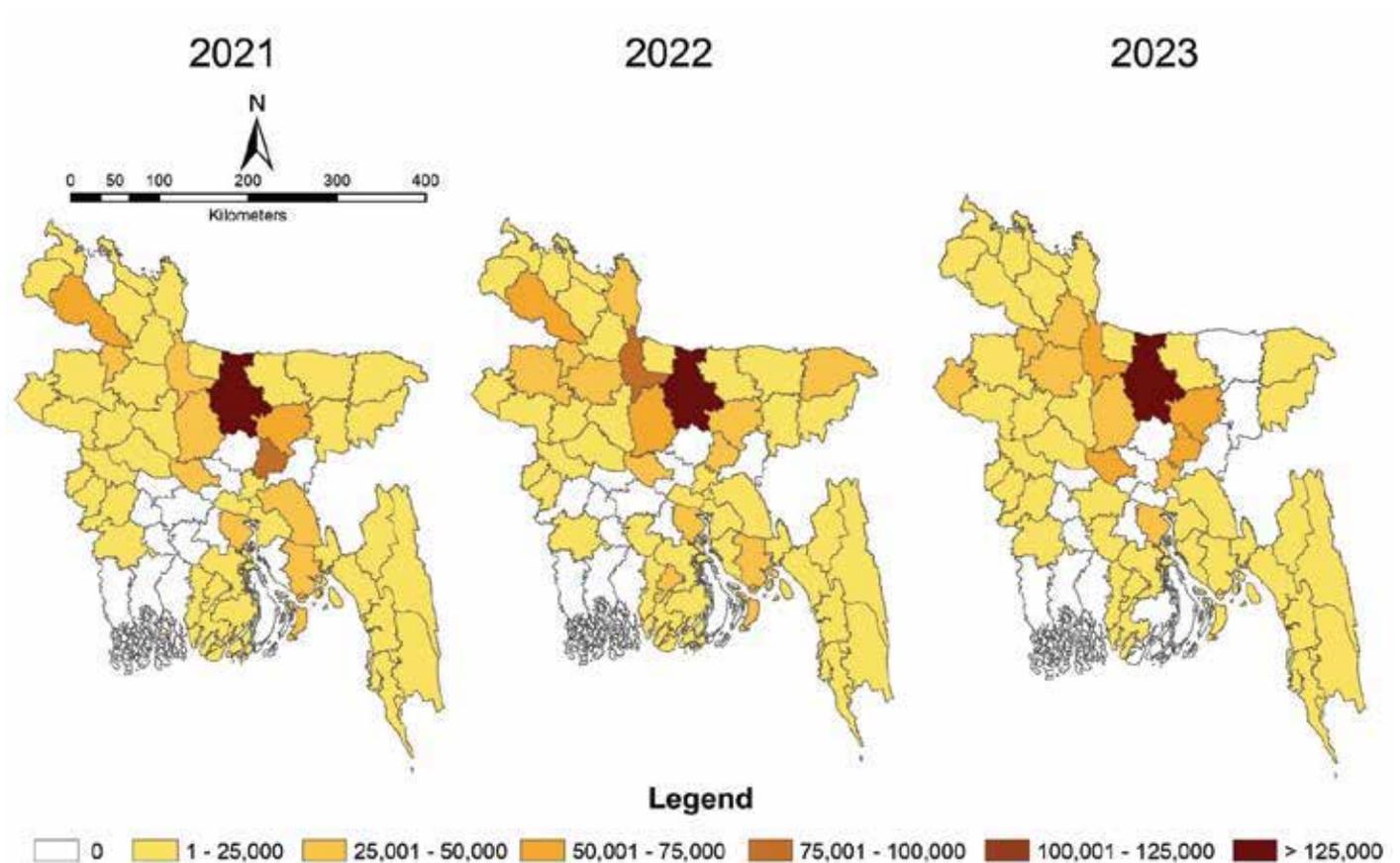


Figure 24: Geographical distribution of mycoplasma by year, 2021- 2023

Comparably more mycoplasma cases were reported in Mymensingh each year (2021, 2022, and 2023). No case was reported in Khulna region in 2021, 2022 and 2023.

2.2.2.6. Newcastle disease

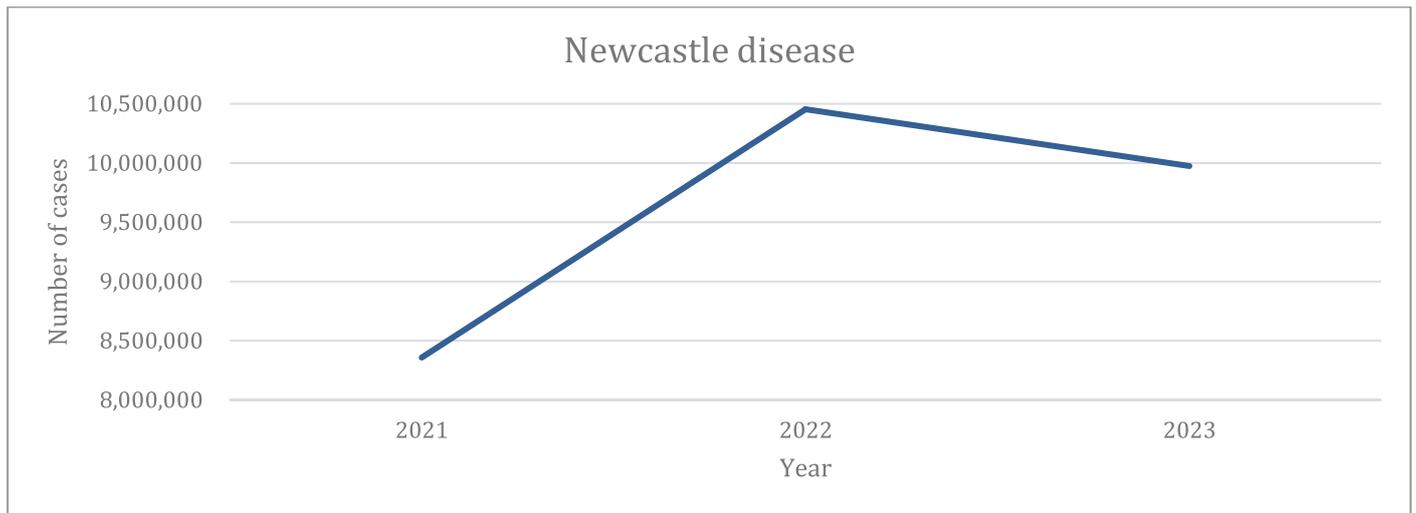


Figure 25: Number of reported Newcastle disease cases by month, 2021 - 2023

A total of 8,358,583, 10,454,224, and 9,974,812 Newcastle disease cases were reported in 2021, 2022, and 2023, respectively. The number of Newcastle disease cases increased by 25% in 2022, compared to 2021 and decreased by 5% in 2023, compared to 2022.

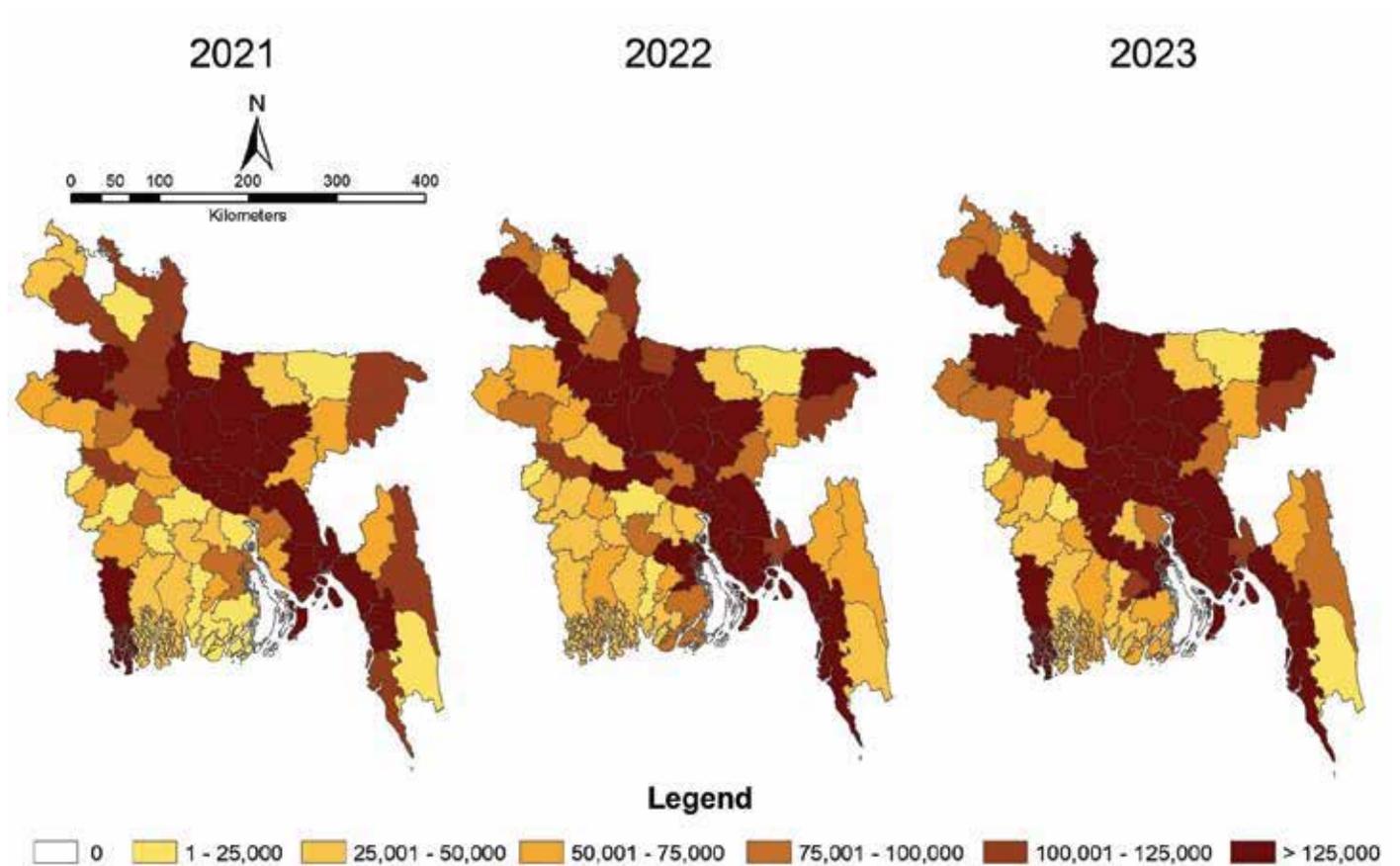


Figure 26: Geographical distribution of Newcastle disease by year, 2021 – 2023

Newcastle disease was reported all over the country. More Newcastle cases were reported in Chattogram between 2021-2023

3. Outbreak Investigations

The DLS Epidemiology Cell conducted 21 outbreak investigations nationwide from 2021 to 2023. FAO ECTAD in Bangladesh provided technical and operational support to all the outbreak investigations as well as the preparation and dissemination of outbreak reports to the Director General of DLS and respective field offices following each investigation. According to the list of outbreak events (Table 2), most events (12) occurred in 2023 and least events (3) occurred in 2022. Lumpy skin disease (LSD) was the most (5) occurring event in 2021-2023 followed by foot and mouth disease (3) and lead poisoning (3).

Year	Species Affected	Outbreak Events	Location
2021	Cattle	Foot and mouth disease (FMD)	Satkhira
	Buffalo	Heavy parasitic load	Laxmipur
	Poultry	Newcastle and gumboro disease	Chandpur
	Cattle	Lumpy skin disease (LSD)	Chattogram
	Cattle	Lead poisoning	Dinajpur
	Goat	Goat pox	Rangamati
2022	Cattle	Hypothermia	Chapai Nawabganj
	Cattle	Lumpy skin disease (LSD)	Sirajganj
	Cattle	Anthrax	Natore
2023	Cattle	Lead poisoning	Brahmanbaria
	Cattle	Lead poisoning	Dhaka
	Goat	Peste des petits ruminants (PPR)	Takurgoan
	Cattle	Black quarter (BQ)	Takurgoan
	Cattle	Lumpy skin disease (LSD)	Satkhira
	Cattle	Lumpy skin disease (LSD)	Jalpur
	Cattle	Lumpy skin disease (LSD)	Dinajpur
	Cattle	Faulty vaccine administration	Chapainawabganj
	Cattle	Foot and mouth disease (FMD)	Nilphamari
	Cattle	Foot and mouth disease (FMD)	Dinajpur
	Cattle	FMD and Hemorrhagic septicemia (HS) co-infection	Dinajpur
	Swine	African swine fever (ASF)	Rangamati

Table 2: Year-wise list of outbreak events in different location of Bangladesh

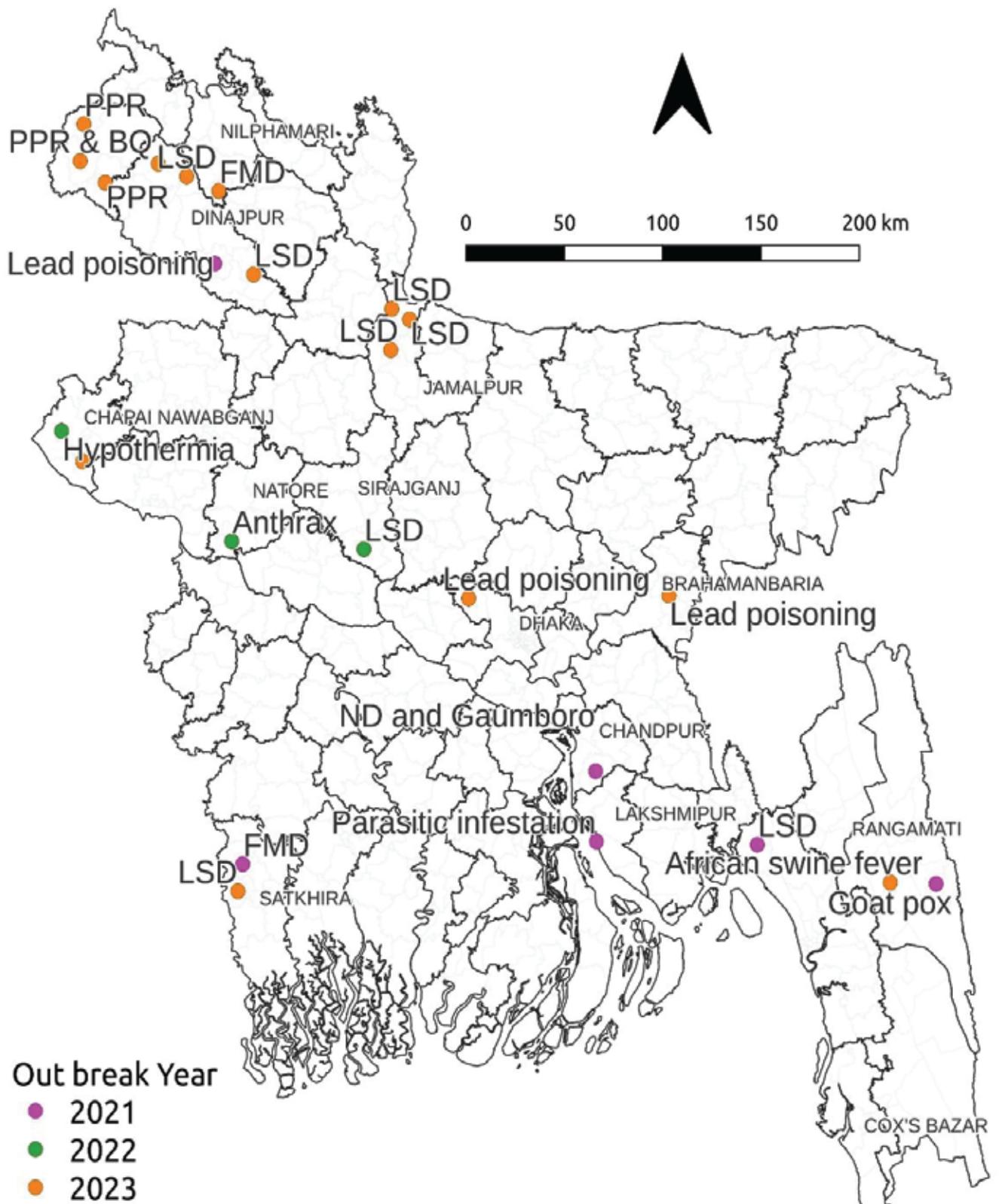


Figure 27: Distribution of disease outbreaks

After recent LSD outbreaks in Bangladesh, DLS has been trying to control the disease by using a goat pox vaccine with technical support from FAO ECTAD. The effectiveness of the existing goat pox vaccine in Bangladesh has been evaluated and it was recommended to replace the existing goat pox vaccine seed. Thus, DLS has been seeking a goat pox case to obtain a wild vaccine candidate virus from the field to use as a potential goat pox vaccine seed.

Subsequently, with technical support from FAO ECTAD, the goat pox virus has been isolated from the outbreak which was conducted analysis of passive surveillance data and it is on the way to be prepared as a vaccine seed. Therefore, the recent detection of goat pox in Bangladesh may be a significant finding to assist in the control of LSD in Bangladesh.

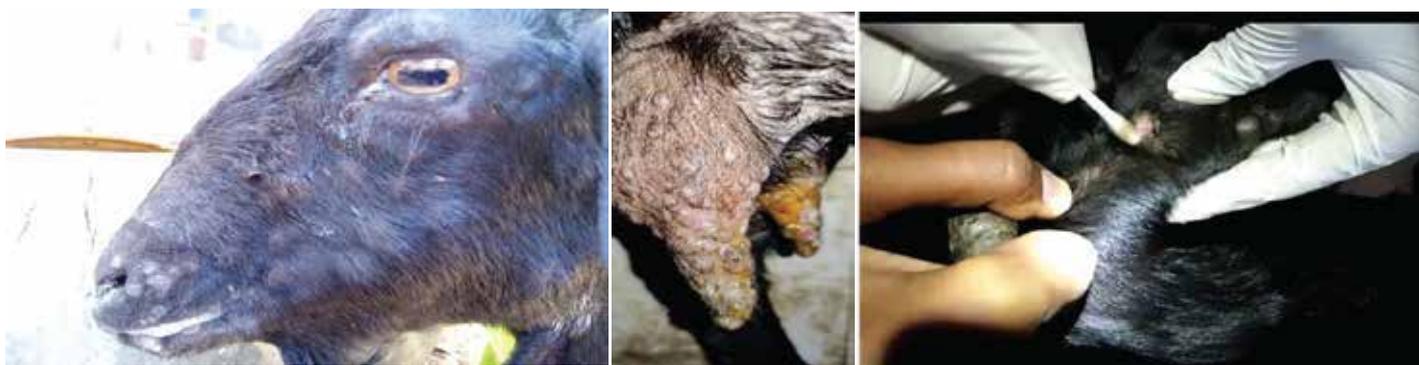


Figure 28: Infected goat and sample collection from infected goat during outbreak investigation in Rangamati district.

In November 2023, Bangladesh experienced its first outbreak of African Swine Fever (ASF) on "Pig Development Farm" situated in the Rangamati Hill District, located in the southeastern region of the country. After receiving the information of pigs died from an unknown disease infection in Rangamati Hill District, DLS carried out a thorough investigation with the help of FAO-ECTAD. The outbreak affected a total of 434 pigs, leading to the death of the entire population by December 2023. DLS promptly notified the World Organization for Animal Health (WOAH) of the occurrence (Event ID: 5376, Report ID: IN_164219). Subsequent measures were implemented to control the unrestricted movement of pigs in the hilly areas, accompanied by a comprehensive awareness campaign organized by the District Livestock Office, Rangamati. Additionally, the DLS has initiated an epidemiological study, prioritizing the hilly regions, to know the source, spread of the disease, and other dynamics.

4. Outbreak Control

4.1 Lumpy Skin Disease (LSD)

In December 2020 and January 2021, a pilot blanket vaccination campaign using Lumpyshield™ (Goatpox Gorgan strain) vaccine was successfully conducted in Mirsharai, Nawabganj, and Shahjadpur upazilas of Chattogram, Dinajpur, and Sirajganj districts, respectively, as part of the FAO-funded emergency technical cooperation project. A study was conducted to evaluate the effectiveness of the pilot programme in terms of implementation, antibody response, and prevention of the disease

No farmer reported any clinical signs of LSD and adverse reactions in their cattle after vaccination. During the post-vaccination surveillance, 99 LSD cases were identified, with 5 occurring in vaccinated areas and the remaining 94 occurring in unvaccinated areas. As a result, the incidence rate in vaccinated areas was 0.007%, while it was 0.19% in unvaccinated areas. Compared to cattle in vaccinated areas, cattle in unvaccinated areas were more than 27 times (RR=27.1, chi-square $p < 0.001$) more likely to be infected. It should be noted that the five affected cattle in the vaccinated

areas were unvaccinated animals that either escaped vaccination or were introduced from unvaccinated areas. Seropositivity was 26% in unvaccinated cattle and 52% in vaccinated cattle. Only half of the cattle in vaccinated areas tested positive for antibodies 7-9 months after vaccination.

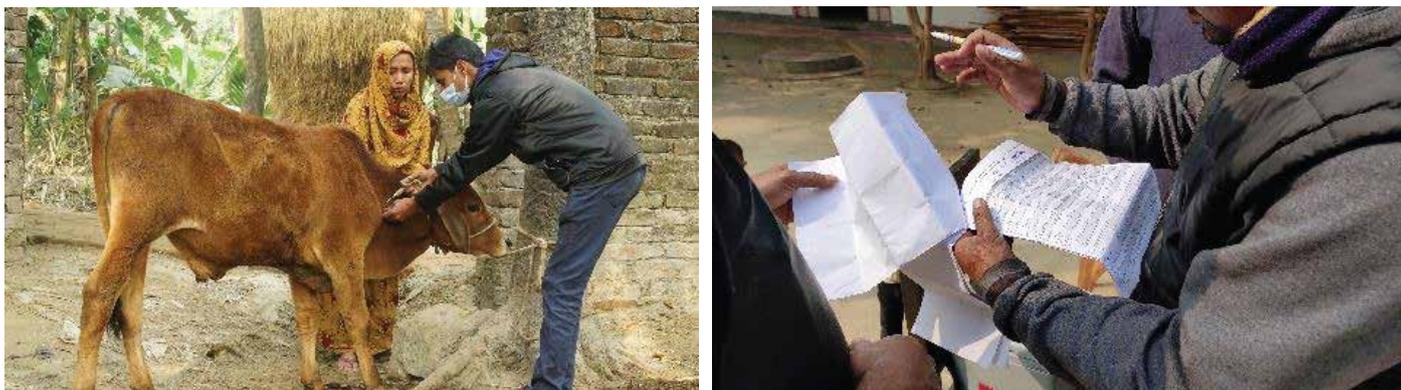


Figure 29: LSD vaccination and monitoring activities going on in the field

This study demonstrated that blanket vaccination is an effective tool that can be used by DLS for the prevention and control of LSD in Bangladesh. Although country-wide blanket vaccination at a time would be most effective, considering the present capacity of DLS and the availability of resources, a risk-based vaccination campaign was recommended for progressive control of LSD in Bangladesh

5. Other highlights

5.1 Field Epidemiology Training Program for Veterinarians (FETPV)

To prevent, detect and timely respond to the animal health threats such as infectious diseases (emerging and re-emerging), zoonotic diseases it is necessary for the country to increase the epidemiological ability of the field veterinarian. In order to address the situation Department of Livestock Services (DLS) with funding support from GHD|EMPHNET and in collaboration with the Chattogram Veterinary and Animal Sciences University (CVASU), implemented the field epidemiology training program for veterinarians (FETPV) in Bangladesh. FETP is a two-year program designed to build the country's veterinary workforce in outbreak response and surveillance of potentially dangerous zoonotic pathogens and to promote the use of the One Health Approach to address human, animal, and environmental health issues. The overall course is divided into 30:70 theory and practical components and will be delivered over four academic semesters. Residents will collaborate closely with mentors and supervisors to complete their field assignments and deliverables. CVASU's One Health Institute will also offer an MS degree in Applied Veterinary Epidemiology. Thus, this FETPV course will equip field veterinarians with field-based epidemiological skills, allowing the department to respond to any emergency in a timely manner.

