Asian J. Med. Biol. Res. 2025, 11(3), 59-72; https://doi.org/10.3329/ajmbr.v11i3.81484

Asian Journal of Medical and Biological Research
ISSN 2411-4472 (Print) 2412-5571 (Online)
https://www.ebupress.com/journal/ajmbr/

Article

Necropsy-based diagnosis and commonly used drugs for poultry diseases in the Jamalpur district, Bangladesh

Arnab Kumer Sutra Dhar[1], Ashing Yaing Marma[1], Muhtadi Md. Waliullah[1], Marium[1], Md. Mominul Islam[1], Mst. Sharifa Jahan[2] and Sajeda Sultana[1*]

[1]Department of Pathology, Faculty of Animal Science and Veterinary Medicine, Sher-e-Bangla Agricultural University, Dhaka-1207, Bangladesh
[2]Department of Pharmacology and Toxicology, Sher-e-Bangla Agricultural University, Dhaka-1207, Bangladesh

*****Corresponding author: Sajeda Sultana, Department of Pathology, Faculty of Animal Science and Veterinary Medicine, Sher-e-Bangla Agricultural University, Dhaka-1207, Bangladesh. E-mail: sajeda.vet.path@sau.edu.bd

Received: 05 May 2025/Accepted: 31 August 2025/Published: 17 September 2025

Abstract: Poultry farming plays a crucial role in the livestock economy of Bangladesh. This study aimed to investigate the occurrence of diseases and the commonly used drugs in poultry species in Jamalpur, Bangladesh. A total of 233 poultry cases were examined at the Jamalpur District Veterinary Hospital from September to December 2023. Diagnosis was based on a combination of clinical history, signs, and necropsy findings. Commonly used drugs for treatment purposes were also recorded, and all data were analyzed using standard statistical tools. Among broiler birds, the following diseases were identified, including Infectious Bursal Disease (IBD) (18.60%), Inclusion Body Hepatitis (IBH) (10.46%), Newcastle Disease (ND) (6%), Lymphoproliferative Disease (2.32%), Colibacillosis (13%), Salmonellosis (8.13%), Coccidiosis (11.62%), Visceral Gout (16.27%), and mixed infections (14%). In layer birds, the recorded diseases included ND (19.70%), Mycoplasmosis (13.63%), Colibacillosis (12.12%), Fowl Cholera (10.60%), Marek's Disease (9.10%), Stroke Syndrome (7.57%), IBH (6%), Fowl Typhoid (4.54%), and mixed infections (7.57%). In Sonali chickens, ND (30%), Coccidiosis (26.26%), Mycoplasmosis (13.33%), Salmonellosis, and Colibacillosis were equally prevalent (10%). In Desi chickens, Coccidiosis (36.36%) and Ascites (9.09%) were recorded, while Duck Cholera (43.75%) and Duck Viral Hepatitis (25%) were observed in ducks. Salmonellosis was found in 40% of pigeons. Regarding age, the susceptibility to infection was as follows: broilers (above 22 days) 30.23%, Sonali (above 50 days) 33%, adult layers (19-52 weeks) 45.45%, Desi chickens (0-8 weeks) 32%, and both young and adult ducks were equally susceptible (31.25%). The most commonly used drug was ciprofloxacin (23%), followed by gentamicin (15%), sulfonamide (14%), enrofloxacin (13%), macrolides (12%), and toltrazuril (5%). Viral diseases were more prevalent in broiler and Sonali birds, while bacterial infections were common in layers and ducks. Protozoal diseases were prevalent in Desi chickens, pigeons, and turkeys. A comprehensive study is needed to identify poultry diseases based on seasonal patterns, as well as to investigate common drug efficacy and resistance patterns. This would help improve treatment protocols and raise awareness of antimicrobial resistance (AMR).

Keywords: poultry species; gross lesions; investigation; viral infections; ciprofloxacin

1. Introduction

The poultry industry in Bangladesh is one of the fastest-growing sectors, significantly contributing to food security, nutrition, and rural livelihoods. However, the productivity and profitability of commercial layer farms are increasingly threatened by high mortality rates, reduced feed efficiency, and poor bird welfare (Islam *et al.*, 2014a). The emergence of severe diseases poses a serious threat to this sector, discouraging poultry rearing and leading to economic losses. These diseases account for 30% of annual bird deaths, resulting in catastrophic financial impacts. Notable diseases affecting poultry farms include Newcastle disease (ND), infectious bursal disease (IBD), avian influenza virus (AIV), and bacterial infections such as salmonellosis and colibacillosis (Meher *et al.*, 2022; Roky *et al.*, 2022; Khalil *et al.*, 2024). Early diagnosis of respiratory pathogens could help reduce mortality rates within infected flocks by providing insight into potential supportive treatment options (Parvin *et al.*, 2022). Additionally, disease prevalence varies based on the bird's age, breed, season, and geo-climatic conditions (Hassan *et al.*, 2016).

Poultry production in Bangladesh is highly vulnerable to a wide range of infectious and non-infectious diseases that affect bird health, growth, and overall farm profitability. The occurrence and distribution of these diseases are influenced by multiple factors, including environmental conditions, flock density, biosecurity practices, vaccination schedules, and farm management systems (Akter *et al.*, 2025c; Alam *et al.*, 2025). Respiratory and enteric diseases are particularly common, often leading to high morbidity and mortality in both commercial and backyard flocks. In addition, mixed infections are frequently observed, complicating diagnosis and treatment (Liu *et al.*, 2025). Despite the availability of vaccines and therapeutic interventions, disease outbreaks remain a major constraint for sustainable poultry farming, highlighting the importance of continuous surveillance, proper disease diagnosis, and evidence-based treatment strategies (Carpenter *et al.*, 2022; Bist *et al.*, 2024).

Antibiotics and other therapeutic drugs play a central role in the management of poultry diseases, particularly bacterial and protozoal infections that significantly impact flock health and productivity (Abreu *et al.*, 2023). Commonly used antibiotics in Bangladesh include fluoroquinolones such as ciprofloxacin and enrofloxacin, aminoglycosides such as gentamycin, and macrolides such as tilmicosin, which are prescribed for respiratory and systemic infections (Chowdhury *et al.*, 2021). Sulfonamides are widely used against gastrointestinal and respiratory pathogens, while toltrazuril and other anticoccidial drugs are administered to control coccidiosis (Hagag *et al.*, 2020). Multivitamin combinations, such as liso-vit often used alongside antibiotics, are also prescribed to support recovery (Alagawany *et al.*, 2021). Although these drugs provide short-term relief and reduce mortality, their indiscriminate use, inappropriate dosing, and lack of veterinary oversight contribute to treatment failure and the growing threat of antimicrobial resistance in poultry production systems (Abreu *et al.*, 2023; Caneschi *et al.*, 2023).

Jamalpur district, located in the northern part of Bangladesh, is one of the most densely populated poultry regions, featuring numerous small and medium-sized poultry farms. Poultry diseases are a recurring issue in this area, influenced by various factors such as geographical conditions, farmers' management practices, the immunization status of the farms, the quality of the chicks, the biosecurity measures in place at farms and hatcheries, and social awareness. However, data concerning poultry diseases and their treatment protocols in Jamalpur district are limited. Understanding the distribution of diseases and the consumption of drugs in the poultry industry is crucial for establishing effective disease control measures and ensuring the sustainable development of the industry. To address these gaps, this study aims to investigate the current trends in disease patterns and commonly used treatments. This localized data on disease prevalence and treatment practices is essential for developing effective and tailored mitigation strategies.

2. Materials and Methods

2.1. Ethical approval and informed consent

This research did not require ethical approval from the university. The necropsy procedure was performed for diagnostic purposes and subsequent treatment, with the assistance of veterinary officials at the District Veterinary Hospital (DVH), after the poultry owners provided verbal consent.

2.2. Research area and duration

The study was conducted at the DVH in Jamalpur, one of Bangladesh's most densely populated poultry-producing zones, from September to December 2023 (Figure 1).

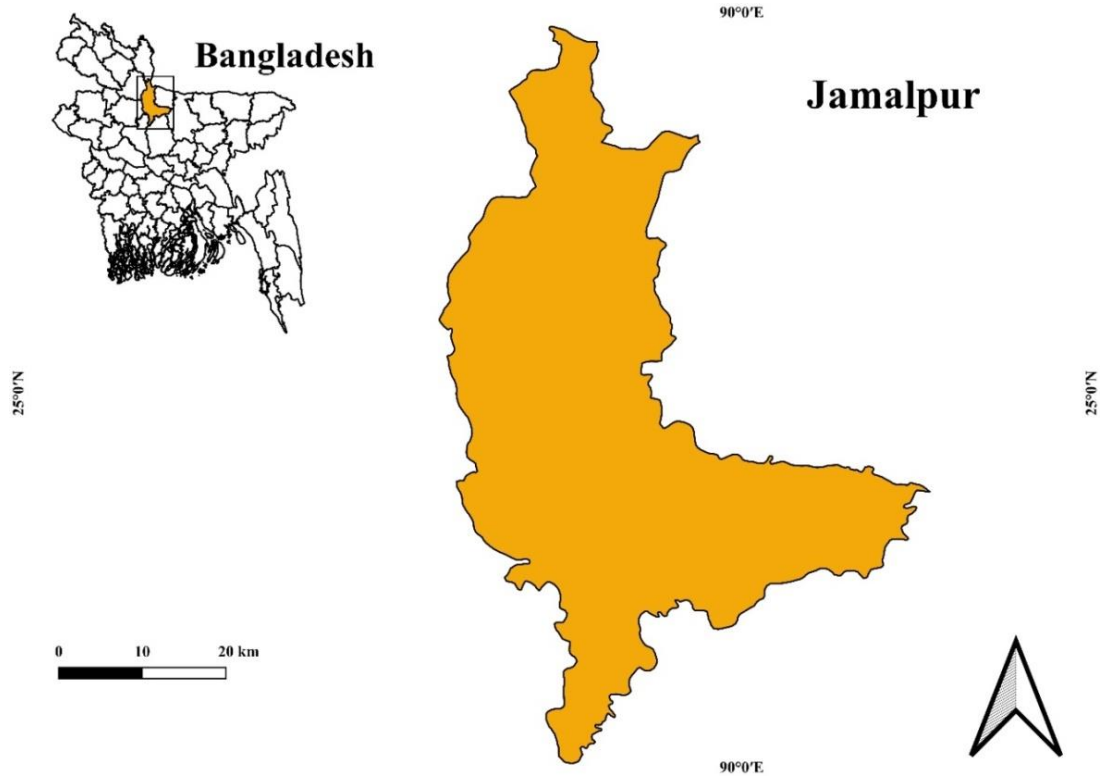

Figure 1. The study was conducted in the Jamalpur district, Bangladesh.

2.3. Study animals and data collection

A total of 233 dead birds from various poultry farms in different areas of the Jamalpur district were brought to the DVH for treatment. Each bird was systematically dissected, and gross pathological alterations and observations were recorded. The necropsy examination techniques adhered to all standard protocols (Chauhan *et al.*, 2007). Diagnoses were made based on the owner's clinical history, complaints, and necropsy findings.

2.4. Data collection and statistical analysis

Disease-related data were collected from farm owners through face-to-face interviews regarding the on-farm environment, disease population, species, number of poultry on the farm, age, biosecurity conditions, rearing system, name of the current disease outbreak, number of dead birds during the outbreak, and treatments administered. Microsoft Office Excel 2016 was used to log and process the gathered data for description and evaluation. The map of the study area was prepared using QGIS version 3.40.

3. Results

3.1. Species-wise distribution of reported cases in poultry

Among the 233 cases, the study revealed that 86 were broilers, 66 were layers, 30 were Sonali, 22 were Desi, 16 were ducks, 10 were pigeons, and 3 were turkeys. Broiler chickens were the most frequent, accounting for 36.4%, followed by layers at 28.75%, Sonali at 13%, and Desi chickens at 9.64%. The fewest cases were of turkeys, representing 1.28% (Table 1).

Table 1. Species-wise distribution of reported cases in poultry.

Species/Breed	Number	Percentages
Broiler	86	36.41%
Layer	66	28.75%
Sonali	30	12.87%
Desi	22	9.64%
Duck	16	6.87%
Pigeon	10	4.17%
Turkey	3	1.28%
Total	**233**	**100%**

3.2. Distribution of poultry disease cases by etiological group

The research findings revealed that viral disease was the most prevalent among broiler chickens, with 32 cases identified out of 86 individuals examined. In contrast, bacterial diseases accounted for 27 cases among 66 examined layer chickens. Ducks and pigeons also showed a similar susceptibility to viral disease, with 6 cases among 16 ducks and 5 cases among 10 pigeons. Additionally, the data indicate that layer birds are primarily prone to bacterial diseases. However, a notable exception was observed in Sonali birds, which exhibited equal susceptibility to both viral and bacterial diseases, with a total of 20 prevalent cases among 30 individuals. Similarly, Desi chickens displayed susceptibility to protozoal diseases, with 8 cases identified out of 22 examined individuals. Mixed infections were most commonly observed in broiler birds, with 12 cases reported out of 24 (Table 2).

Table 2. Distribution of poultry disease cases by etiological group.

Species/Breed	Viral	Bacterial	Protozoal	Metabolic	Mix infections	Total
Broiler (86)	32	18	10	14	12	86
Layer (66)	23	27	6	5	5	66
Duck (16)	6	4	3	2	1	16
Pigeon (10)	5	2	1	2	-	10
Sonali (30)	10	10	8	-	2	30
Desi (22)	3	5	8	2	4	22
Turkey (3)	-	1	2	-	-	3
Total	**79**	**67**	**38**	**25**	**24**	**233**

3.3. Comparative distribution of disease etiologies among poultry species

In broiler birds, viral diseases are the most common, affecting 37.20% of the population, while protozoal diseases are the least common at 11.62%. Among layer birds, bacterial diseases have the highest frequency at 40%, whereas metabolic and mixed infectious diseases are the least frequent, occurring in only 7.57% of cases. Sonali birds show equal susceptibility to both viral and bacterial diseases, with a prevalence of 33.33%. Desi chickens are primarily susceptible to protozoal diseases at 36.36%, with the lowest susceptibility to metabolic diseases at 9.09%. Ducks have the highest incidence of bacterial diseases at 56.26%, while viral diseases are less common, affecting 43.75% of the population. Both pigeons and turkeys exhibit high rates of protozoal diseases, with incidences of 60% and 66.66%, respectively (Figure 2).

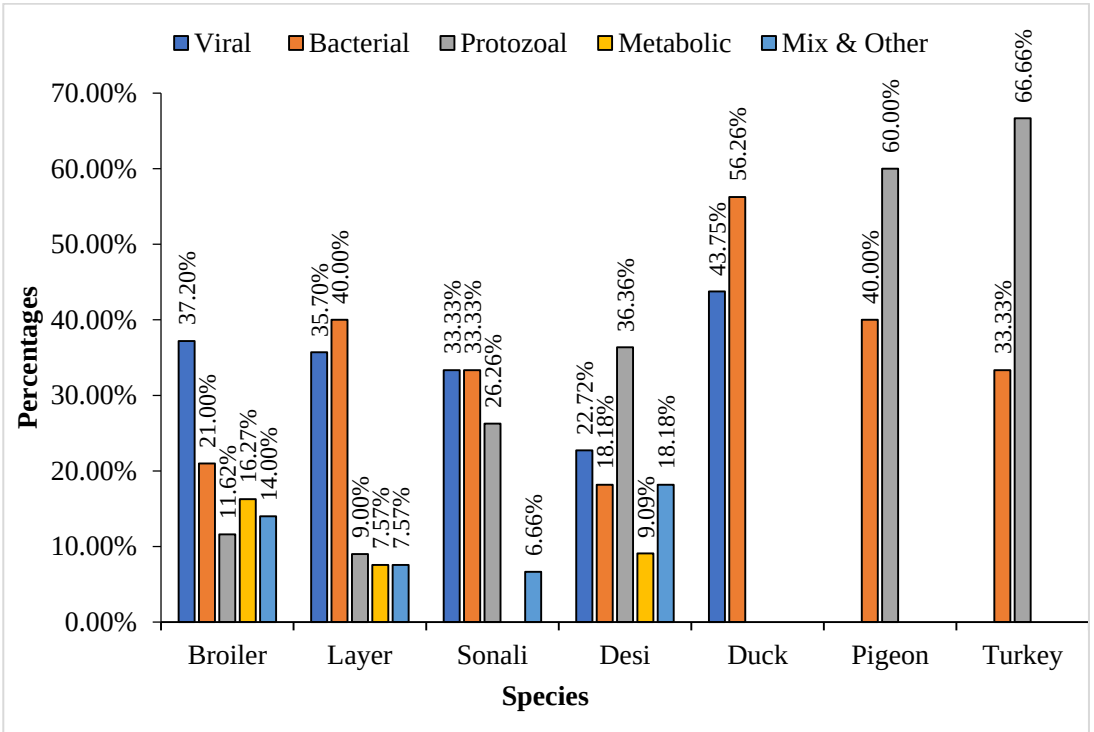

Figure 2. Comparative distribution of disease etiologies among poultry species (N=233).

3.4. Prevalent diseases in broiler

The IBD was the most common condition, accounting for 18.60% of cases. It was followed by Visceral Gout at 16.27%, mixed infections at 14%, Colibacillosis at 13%, and Coccidiosis at 11.62%. Inclusion Body Hepatitis (IBH) comprised 10.46% of cases. Additionally, Salmonellosis, ND, and Lymphoproliferative Disease were observed at rates of 8.13%, 6%, and 2.32%, respectively (Figure 3).

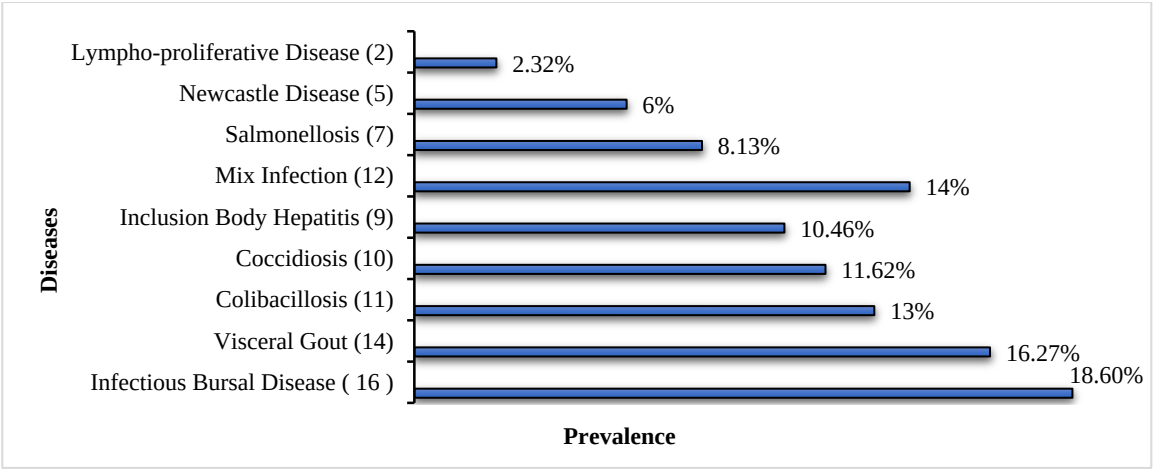

Figure 3. Distribution of disease prevalence among broiler chickens (N=86).

Representative gross postmortem lesions in various prevalent diseases in broilers are presented in Figure 4.

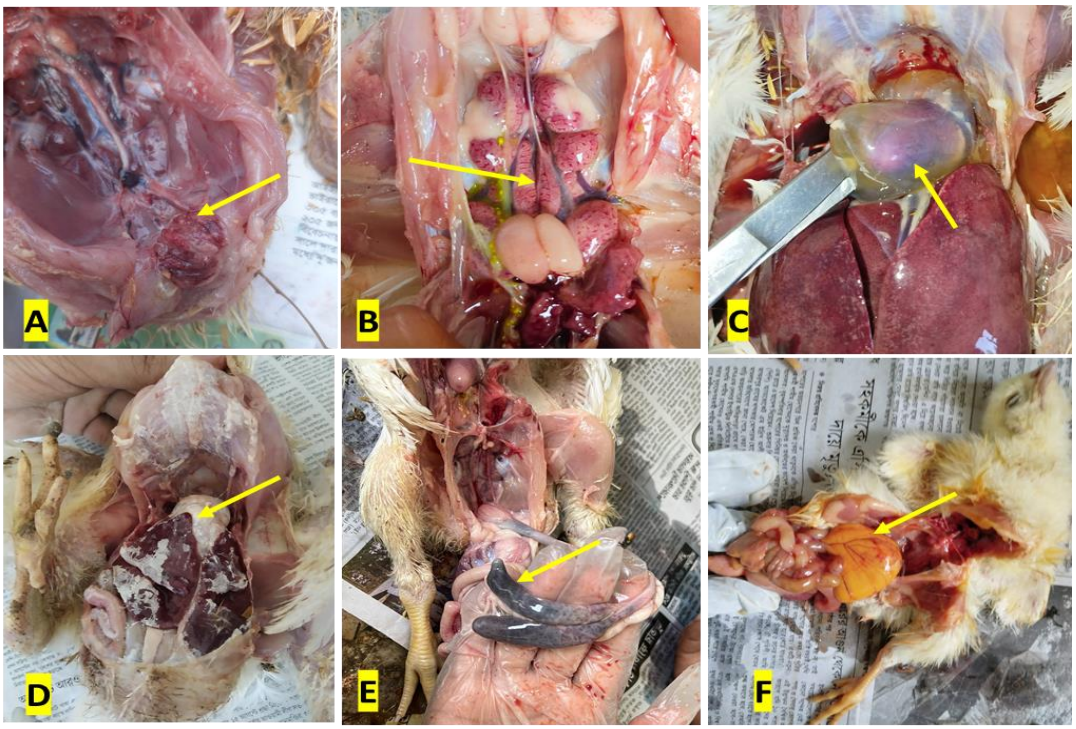

Figure 4. Gross postmortem lesions observed in diseased broiler chickens. [A] 21 days of age IBD infected broiler chicken with swollen, hemorrhagic and edematous bursa. [B] 26 days of age IBD infected broiler with swollen, pale, enlarged kidneys showing prominent tubular pattern and the ureters on both sides are dilated and packed with urate salts. [C] 24 days of age broiler with swollen liver containing multiple pale or necrotic foci and hydropericardium (inclusion body hepatitis/Lichi disease). [D] 10 days of age starter chick with a visible, chalky white deposit on the surface of the liver and heart (visceral gout). [E] 15 days of age broiler with bloody, thickened cecal walls, with distended accumulation of clotted blood (Cecal Coccidiosis). [F] 3 days of age starter chick with unabsorbed (Retained) edematous yolk sac (*E. coli* infection).

3.5. Prevalent diseases in layer

Among the various pathogens, ND was the most prevalent, accounting for 19.70% of cases. It was followed by Mycoplasmosis at 13.63%, Colibacillosis at 12.12%, and Fowl Cholera at 10.60%. Marek's Disease and Coccidiosis each represented 9.10%, while Stroke Syndrome was observed in 7.57% of cases. The IBH contributed to 6%, Fowl Typhoid to 4.54%, and mixed infections also accounted for 7.57% (Figure 5).

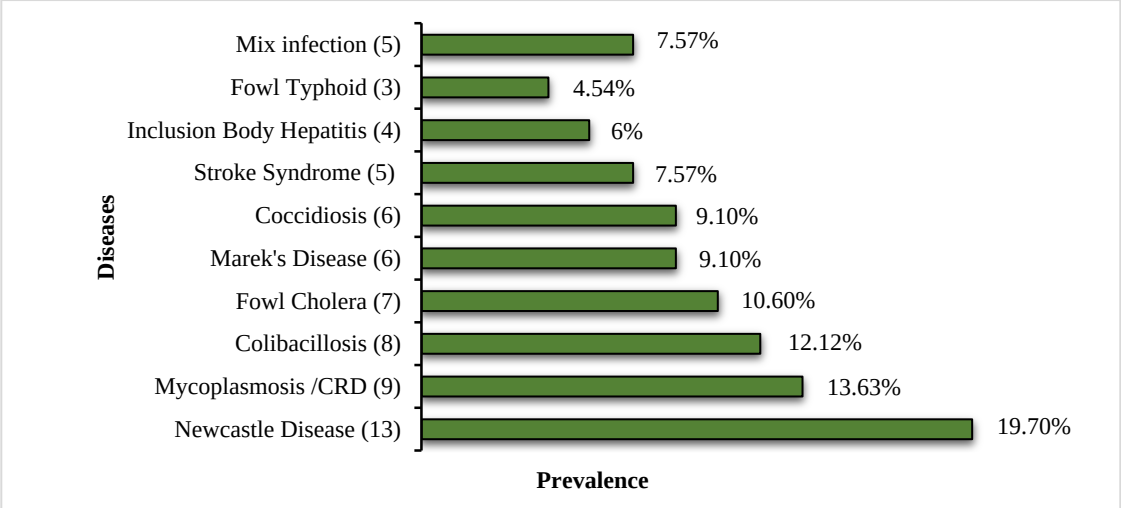

Figure 5. Distribution of disease prevalence among layer chickens (N=66).

Representative gross postmortem lesions in various prevalent diseases in layer birds are presented in Figure 6.

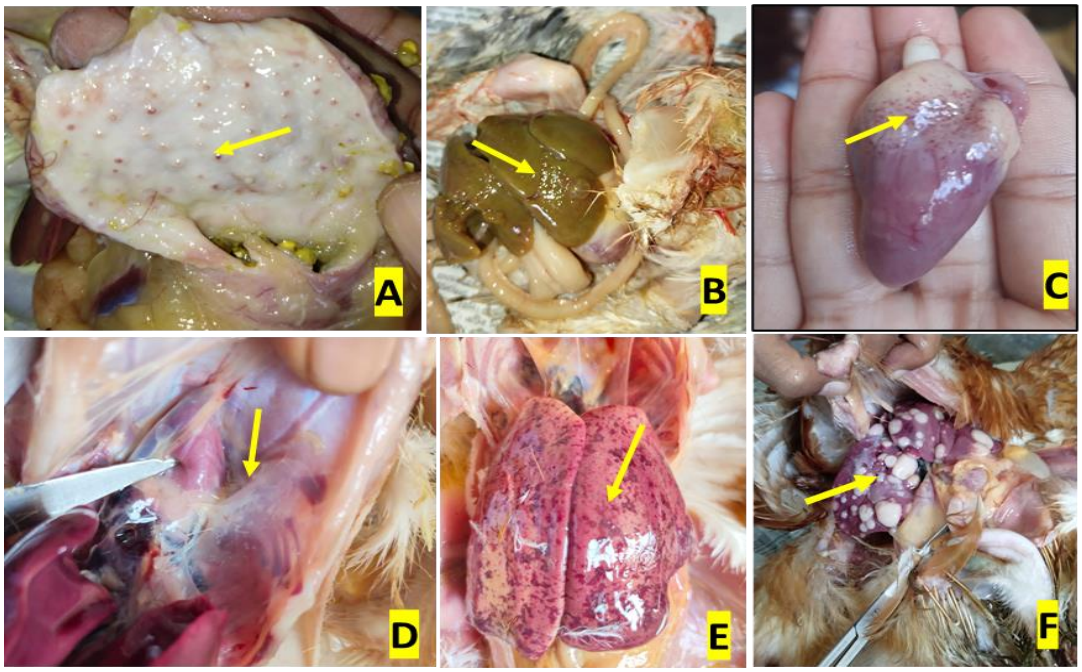

Figure 6. Gross postmortem lesions observed in diseased layer chickens. [A] 20 Weeks of age laying hen with pin point hemorrhage on tip of the proventriculus (Newcastle disease). [B] 10 Weeks of age layer bird with bronze color liver with bile- stained liver surface (Fowl Typhoid). [C] 15 weeks of age layer bird with pin point hemorrhage in the base of the heart (Fowl Cholera). [D] 8 Weeks of age layer bird with cloudy and large amounts of fibrin deposited on the thoracic air sacs (CRD). [E] 10 weeks of age layer with enlarged, pale, and crumbly liver with multiple necrotic or hemorrhagic foci (IBH). [F] 30 weeks of age laying hen with diffuse enlargement of the organ with multiple, small, greyish-white, rounded foci or nodules scattered throughout, indicating the presence of tumor-like masses of lymphoid cells (Lymphoproliferative disease/ Mareks).

3.6. Prevalent diseases in Sonali

ND was the most prevalent, contributing 30% of cases, followed by Coccidiosis at 26.26% and Mycoplasmosis at 13.33%. Salmonellosis and Colibacillosis each accounted for 10%, while mixed infections (IBD, ND, and Colibacillosis) were observed in 6.66% of cases. IBD comprised 3.33% of the total (Figure 7).

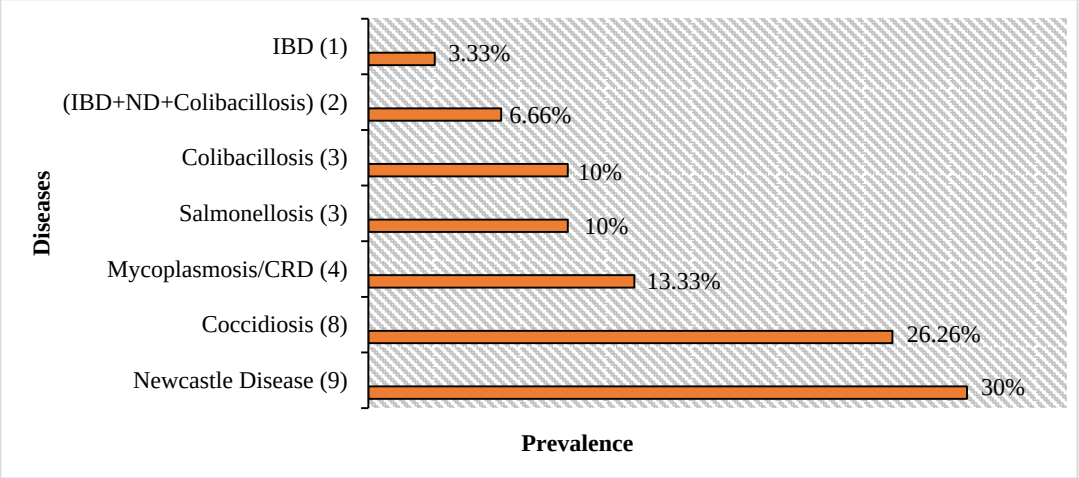

Figure 7. Distribution of disease prevalence among sonali chickens (N=30).

Representative gross postmortem lesions in various prevalent diseases in Sonali birds are presented in Figure 8.

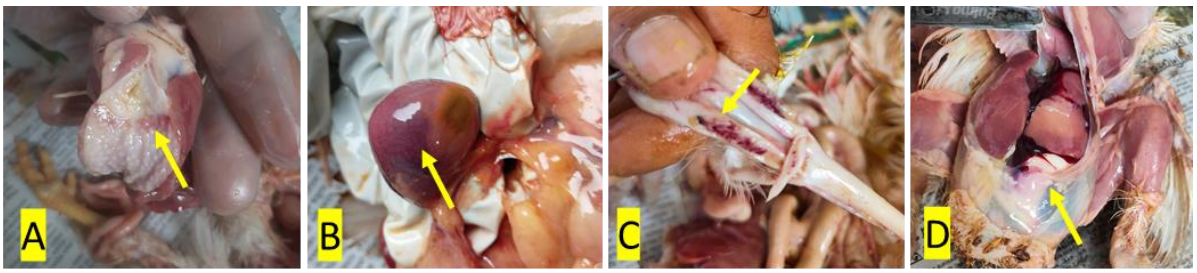

Figure 8. Gross pathological findings observed during postmortem examination of Desi and Sonali chickens. [A] 6 weeks of age Deshi chicken with hemorrhage between the gizzard-proventricular junction (Gumboro/IBD). [B] 7 weeks of age Sonali bird with necrosis and hemorrhagic foci of the spleen (Subclinical ND). [C] 6 weeks of age Sonali bird with hemorrhage in cecal tonsil (ND). [D] 5 weeks of age Deshi chicken with accumulation of water in lower abdomen (Ascites).

3.7. Prevalent diseases in Desi chicken

Coccidiosis was the most common condition, accounting for 36.36% of cases, followed by ND at 22.72% and a mixed Mycoplasmosis-Colibacillosis infection at 18.18%. Colibacillosis alone represented 13.63% of cases, while Ascites accounted for 9.09% (Table 3). Representative gross postmortem lesions associated with the prevalent diseases in desi chickens are shown in Figure 8.

Table 3. Distribution of prevalent diseases in Desi chicken.

Disease name	No.	Prevalence (%)
Coccidiosis	8	36.36
Newcastle Disease	5	22.72
Mycoplasmosis + Colibacillosis	4	18.18
Colibacillosis	3	13.63
Ascites	2	9.09
Total	**22**	**100**

3.8. Prevalent diseases in duck

Duck cholera accounted for the majority at 43.75%, followed by duck viral hepatitis at 25%, duck plague at 18.75%, and salmonellosis at 12.50% (Figure 9).

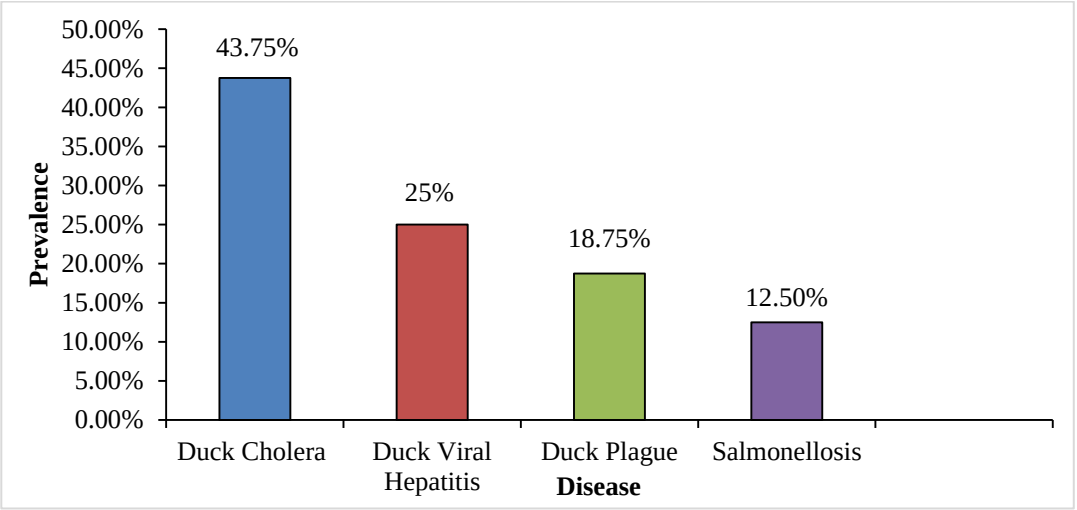

Figure 9. Distribution of prevalent diseases in ducks (N=16).

3.9. Prevalent diseases in pigeon and turkey

Salmonellosis was the most common diagnosis, accounting for 40% of the cases, followed by fungal infections such as Canker/Trichomoniasis at 30%, protozoal infections like Coccidiosis at 20%, and external parasites at 10% (Table 4). Among the three cases of turkey, two were diagnosed with Coccidiosis and one with Salmonellosis.

Table 4. Common disease distribution in pigeons (N=10).

Disease name	Prevalence (%)
Salmonellosis	40
Canker	30
Coccidiosis	20
External Parasite	10

3.10. Prevalence of diseases according to age group

In the case of broilers, the highest number of cases was recorded in the age group above 22 days (30.23%), followed by the 15-21 days age group (26.80%), the 0 to 7 days age group (22.09%), and the 8-14 days age group (21%). The age of the bird had a significant relationship with the prevalence and mortality of the disease, with younger chicks being more susceptible, particularly broiler chicks aged 3-6 weeks. For layer birds, the highest number of cases was recorded in the age group of 19-52 weeks (45.45%), followed by the above 52 weeks age group (30%), the 9-18 weeks age group (15%), and the 0-8 weeks age group (9%). In Desi chickens, the highest number of cases occurred in the age group of 0-8 weeks (32%), followed by the above 52 weeks age group (27%), the 9-18 weeks age group (22%), and the 19-52 weeks age group (18.18%). Starter Deshi chickens aged 0-8 weeks were more susceptible to diseases due to poor management practices, including a lack of vaccination and inadequate biosecurity. In ducks, the highest number of cases was recorded in the age group above 52 weeks and the 0-8 weeks age group, both at 31.25%, followed by the 9-18 weeks age group (25%) and the 19-52 weeks age group (12.50%). Young ducklings, especially starter ducklings aged 0-8 weeks, are particularly vulnerable to diseases. For Sonali chickens, the highest number of cases occurred in those above 50 days old (33%), while the 0-10 days and 11-30 days age groups were equally affected, each representing 23% of cases. Sonali birds aged 31-50 days accounted for 20% of cases. In pigeons, the highest number of cases was recorded in the age group of 0-5 weeks (40%), followed by the 31-81 weeks age group (30%), the 6-30 weeks age group (20%), and the above 81 weeks age group (10%) (Table 5).

Table 5. Age-wise prevalence of disease cases in poultry species.

Species/Breed	Number	Age interval			
		0-8 weeks	**9-18 weeks**	**19-52 weeks**	**Above 52 weeks**
Layer	66	6 (9%)	10 (15%)	30 (45.45%)	20 (30%)
Desi	22	7 (32%)	5 (22%)	4 (18.18%)	6 (27%)
Duck	16	5 (31.25%)	4 (25%)	2 (12.50%)	5 (31.25%)
		0-10 days	**11-30 days**	**31-50 days**	**Above 50 days**
Sonali	30	7 (23%)	7 (23%)	6 (20%)	10 (33%)
		0-5 weeks	**6-30 weeks**	**31-81 weeks**	**Above 81 weeks**
Pigeon	10	4 (40%)	2 (20%)	3 (30%)	1 (10%)
		0-7 days	**8-14 days**	**15-21 days**	**Above 22 days**
Broiler	86	19 (22.09%)	18 (21%)	23 (26.80%)	26 (30.23%)

3.11. Commonly used drugs for treatment purposes

Viral diseases were frequently encountered in the area, necessitating the use of targeted antiviral drugs like Ranovir to control infections. Immune stimulant drugs such as Liso-vit, Immuno-vit, and Booster MAC were regularly administered to further support the health of the birds. These treatments were complemented by antibiotics and antimicrobials to reduce the risk of secondary bacterial infections during viral outbreaks. Additionally, vitamin and mineral preparations were supplied to enhance the overall health, recovery, and immunity of the flock.

A variety of drugs were employed to treat bacterial infections, including specialized antibiotics such as ciprofloxacin (Cipryl-Vet), gentamicin (G-20), Oxytetracycline, Tilmicosin, florfenicol, neomycin, and bronchodilators (Cidacot and Respiratory-P-P), which were often prescribed to address respiratory symptoms caused by specific bacterial infections. Farmers also utilized immunity boosters (Liso-vit, Immunovit, Boost) to enhance disease resistance. Vitamin and mineral premixes, along with symptomatic and nutritional medications like D-Balance, Osteo-plus, P Booster, and Supracid, were used to meet nutritional needs and address secondary complications.

Anticoccidial drugs such as Amprolium HCL (Cocci-nil), toltrazuril, and diclazuril were the primary treatments for infections caused by Eimeria species. Fluconazole (Diflucan) was used for fungal infections, providing antifungal protection. Digestive stimulants and appetite enhancers (Digestive–P) were administered alongside specific antibiotics in cases of cecal erosion. Moreover, gut motility enhancers and probiotics were given to restore gut health and support recovery following protozoal or concurrent infections.

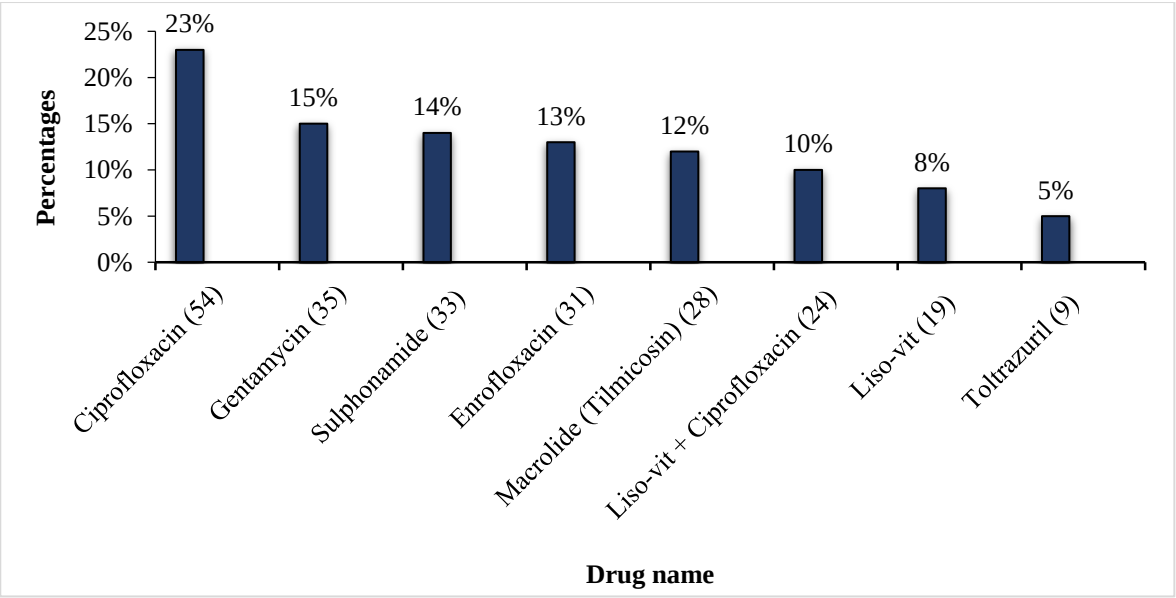

Figure 10. Use of common therapeutic drugs and frequency in poultry cases.

Visceral gout was prevalent during the winter season, which decreased water intake. Allopurinol (Alurol-Vet) was widely used to reduce blood uric acid concentration. Liver tonics such as Hepafit-Vet, Liva-Vet, Hepato-Vet, and Red-Liver-Vet, along with kidney tonics like KC Vet, were incorporated to enhance organ function and facilitate metabolic balance. Sodium bicarbonate was administered to increase water intake in gout-infected birds.

During the study period, a significant number of cases involved mixed infections. To address these complex infections, antibiotics were the primary line of defense. Among the antibiotics, Ciprofloxacin was the most commonly prescribed in hospital settings without an antibiotic sensitivity test, indicating its widespread usage. It had the highest prevalence rate at 23%. Following Ciprofloxacin, Gentamycin was also frequently used, with a rate of 15%. Sulfonamides, Enrofloxacin, Macrolide (Tilmicosin), and other antibiotics were administered in fewer poultry cases.

Ciprofloxacin emerged as the most frequently utilized antibiotic in hospitals, accounting for 23%, followed by Gentamycin at 15%, Sulfonamides at 14%, Enrofloxacin at 13%, Macrolide (Tilmicosin) at 12%, Liso-vit combined with Ciprofloxacin at 10%, Liso-vit alone at 8%, and Toltrazuril at 5%. This comprehensive data suggests that healthcare providers used antibiotics indiscriminately to prevent infections as part of treatment protocols, which may contribute to antibiotic resistance (Figure 10).

4. Discussion

The current pathological analysis identified numerous diseases contributing to the morbidity and mortality of chicks in the Jamalpur region. Birds were analyzed for disease diagnosis based on post-mortem findings, clinical signs, and history. Poultry infections are a common problem primarily caused by geographic and climatic factors, bird population density, management techniques, and vaccination schedules. This research found that 18.60% of broiler chickens in the study area had IBD, which is higher than the 13.1% and 16.9% reported in different districts of Bangladesh (Islam *et al*., 2014b; Chakma *et al*., 2015). A prevalence of 22.00% for IBD was previously reported in the Sylhet district, aligning with the current findings (Badruzzaman *et al*., 2015). The prevalence of IBD in Gazipur was found to be 15.3%, which is lower than in the current study (Rahman *et al*., 2017). Geographic variation may explain this difference. Additionally, the high prevalence of IBD indicates vulnerability among young flocks of chickens. Most flocks with IBD cases are immunized; however, results suggest that vaccination largely failed to protect the birds, possibly due to improper vaccination practices, poor biosecurity, and the presence of virulent strains of the IBD virus.

The prevalence of IBH in this study was 10.46%, consistent with other findings that reported an occurrence of 9.33% in broiler farms in the Faridpur and Narsingdi districts of Bangladesh (Khatun *et al*., 2025). IBH is now a new threat to broiler production, necessitating improvements in biosecurity and vaccination programs.

The prevalence of visceral gout was 16.27%, making it the second most common disease among broilers in this research area. The predominant diseases in broilers from the Kishorgonj area were visceral gout (42.4%), IBD (25.3%), and colibacillosis (15.4%) (Islam *et al*., 2021), with these rates exceeding those observed in the current study. This study found a colibacillosis prevalence of 13%, which is lower than the 6.43% reported in the Kishorgonj District. Research indicated a colibacillosis prevalence of 33.4% in the Gazipur district, higher than what was found in the current study (Rahman *et al*., 2017; Mamun *et al*., 2019).

The present investigation revealed prevalence rates of ND, salmonellosis, and coccidiosis at 6%, 8.13%, and 11.62%, respectively. Another study reported a higher ND prevalence of 13.84% in broilers, indicating that the prevalence of ND in this study is relatively lower in the Sylhet area (Badruzzaman *et al*., 2015).

The prevalence of coccidiosis in broilers (11.62%) was higher than in layer birds (9.1%), attributed to poor management practices in our study area. These findings are supported by another study that reported a coccidiosis prevalence of 7.87% in broiler birds (Badruzzaman *et al*., 2015). Additional research indicated that the prevalence of salmonellosis in the Sylhet district was 7.32% (Rahman and Adhikary, 2016), which is marginally higher (8.13%) than what was observed in the present study.

The current investigation also revealed that mixed infections accounted for 14%, including combinations such as IBD with colibacillosis, coccidiosis with colibacillosis, and ND with salmonellosis. The overall mixed infection prevalence in broilers in the Gazipur area was 7.4% (Rahman *et al*., 2017), which is lower than the rate observed in the current study.

In Bangladesh, the prevalence of broiler viral diseases is influenced by geo-climatic factors such as the environment, temperature, and litter, as well as the care provided to the birds and their immunization status. The ND and IBD are the most common diseases affecting commercial poultry (Badruzzaman *et al*., 2015).

This study recorded the highest number of broiler cases in the age group above 22 days (30.23%). Diseases are primarily observed in broilers aged 3-6 weeks (Sultana *et al*., 2012), which supports our findings. Poor management practices, including overcrowding, inadequate ventilation, and unsanitary environments, can increase the risk of disease outbreaks. Additionally, a lack of access to vaccines or improper vaccination programs can leave flocks vulnerable to viral diseases. Consequently, viral diseases were predominantly prevalent in the study area due to inadequate vaccination, scheduling, and biosecurity measures.

In this study, ND was observed in a greater proportion of cases in layer chickens (19.70%) compared to broiler chickens (6%). The higher susceptibility of layer chickens can be attributed to their prolonged confinement in cages and increased exposure risk. The highest prevalence of ND (19.70%) was recorded in layer birds in the study area. This finding aligns with previous studies conducted in the Kishorgonj area, which reported a prevalence of 10.30% (Rahman *et al*., 2019). Necropsy findings for ND in chickens, including pinpoint hemorrhages in the proventriculus and hemorrhagic lesions in the intestine and trachea (Hasan *et al*., 2016), are consistent with our results. These findings suggest that, despite the availability of ND vaccinations, the poultry industry remains at risk from the reemergence of ND in commercial flocks. It is essential to investigate whether this reemergence is due to vaccination failures or other contributing factors.

Other diseases affecting layers in the current study included Mycoplasmosis at 13.63%, which was slightly higher than the 12.1% reported in another study. Colibacillosis was found to be 12.12% in our study, slightly lower than the 15.9% reported elsewhere. Marek's disease prevalence was 9.10% in our study, comparable to another study that reported 9.3% in Kishorgonj, Bangladesh (Rahman *et al*., 2019).

Another study revealed Salmonellosis at 38.56%, Colibacillosis at 6.7%, and Fowl Cholera at 4.79%. Viral diseases such as ND were found at 16.61%, and Mycoplasmosis at 14.70% in layers in the Gazipur district (Hassan *et al*., 2016). Additionally, another study indicated the prevalence of Fowl Cholera at 15.44%, Colibacillosis at 10.29%, and ND at 8.08% in the Gazipur area (Hossain *et al*., 2015a). In our current study, the prevalence of Fowl Cholera was found to be 10.60%, which is higher than the 4.79% reported by Hassan *et al*. (2016) in Gazipur but lower than the *15.44%* found by Hossain *et al*. (2015b) in Feni, Bangladesh.

Mixed infections, such as IBD combined with coccidiosis (3.6%), IBD with ND and coccidia (0.6%), and IBD with ND (1.5%), were documented in various regions of Bangladesh, supporting the current study's finding of a 7.57% prevalence (Islam *et al*., 2014c). Coccidiosis was found at 9.62% in layer birds in the Feni area, which closely aligns with our current study (Hossain *et al*., 2015b). The prevalence of heat stroke was recorded at 2.20% (Hossain *et al*., 2015a), which is lower than the 7.57% found in the present study. The current study reported Fowl Typhoid and IBH prevalence at 4.54% and 6%, respectively. Poor management practices, such as overcrowding, inadequate ventilation, and unclean conditions, can increase the likelihood of disease outbreaks. Additionally, inadequate vaccination programs or limited access to vaccines may leave flocks susceptible to viral diseases. The indiscriminate use of antibiotics, improper dosages, and failure to follow medication instructions are significant causes of disease susceptibility.

In Sonali chickens, ND was the most prevalent disease, representing 30% of cases, followed by Coccidiosis at 26.66% and Mycoplasmosis at 13.33%. Salmonellosis and Colibacillosis each accounted for 10%, while mixed infections of IBD, ND, and Colibacillosis constituted 2%, and IBD was noted at 3.33%. These findings are consistent with reports from other studies across various regions of Bangladesh (Saleque *et al*., 2003; Islam *et al*., 2014b). ND was reported as the most prevalent disease in Sonali chickens in different regions of Bangladesh at 76.54%, supporting the data from the current investigation (Setu *et al*., 2025). The prevalence of coccidiosis in Sonali chickens was found to be 26.26%, exceeding the findings from Gazipur (Ahmed *et al*., 2009; Islam *et al*., 2014a). Poor waste management and unsanitary conditions in poultry sheds significantly heighten vulnerability to coccidiosis infection. The prevalence of Mycoplasmosis in Sonali chickens noted in our study was 13.33%, aligning with findings from Gazipur (Ahmed *et al*., 2009). A mixed infection of IBD, ND, and Colibacillosis was observed in 6.66% of cases in the current study, which is lower than the 15.89% reported in the Bogura district (Talukdar *et al*., 2017).

In Desi chickens, the most common conditions reported in the current study were Coccidiosis (36.36%), ND (22.72%), and a combination of Mycoplasmosis-Colibacillosis infection (18.18%). Colibacillosis accounted for 13.63% of cases, while Infectious Metabolic Ascites represented 9.09%. The most prevalent disease was Cecal Coccidiosis, attributed to unhygienic farm management and inadequate biosecurity measures; only a minority (22.7%) utilized veterinary hospitals to treat their native chickens (Islam *et al*., 2024). Maintaining a clean and dry environment is crucial for preventing coccidiosis, which can be achieved through strict biosecurity protocols, such as preventing the introduction of infected birds. Vaccination against coccidiosis can also help reduce the severity of the disease (Islam *et al*., 2024). Additionally, coccidiostats—medications that inhibit the development of the parasite—can be used to control coccidiosis.

This study found that Duck Cholera accounted for 43.75% of bacterial infections in ducks, followed by Duck Viral Hepatitis at 25%, Duck Plague at 18.75%, and Salmonellosis at 12.50%. Research in Bangladesh has shown that Duck Cholera significantly impacts duck populations (Khan *et al*., 2021). It is a highly contagious bacterial disease caused by *Pasteurella multocida*. Duck Cholera, along with Duck Plague, is considered a common disease affecting ducks in Bangladesh (Hasan *et al*., 2023). Duck Plague infections can be extremely dangerous, with high mortality rates. Each year, Bangladesh experiences endemic or epidemic outbreaks of this fatal infection (Akter *et al*., 2025a). Ducks aged 4 to 11 weeks are particularly vulnerable to *P. multocida* infection (Srinivasan *et al*., 2024). Factors such as poor sanitation, standing water in duck pens, and the presence of *P. multocida* carriers in healthy flocks contribute to the spread of the disease.

In this study on pigeon disease, Salmonellosis was the most common condition at 40%, followed by fungal infections like Canker/Trichomoniasis at 30%, protozoal infections like Coccidiosis at 20%, and external parasites at 10%. *Salmonella* spp. were commonly found in pigeons that appeared healthy at live bird markets, farms, and villages in Mymensingh, Bangladesh (Hosain *et al*., 2012). A study conducted in Chattogram, Bangladesh, revealed a 29% prevalence of *Salmonella* among sampled pigeons (Bupasha *et al*., 2020), which was lower than the findings of the present study. Another report noted prevalence rates of 40.28% and 37.5% in pigeons in Mymensingh, Bangladesh (Hosain *et al*., 2012), which aligns with the current study's results.

A study on antimicrobial use for poultry diseases in the Kishoreganj district revealed that a combination of Erythromycin, Sulphadiazine, and Trimethoprim was frequently prescribed (23%) for treating poultry. Infected chickens were also treated with Neomycin sulfate (11%), Ciprofloxacin (12%), and a combination of the two. In contrast, the most commonly used antimicrobial for sick ducks was Tiamulin hydrogen fumarate preparation (63%). Another frequently used medication was the combination of Doxycycline and Trimethoprim (12%) for treating birds (Akter *et al*., 2025a).

In our study, the most commonly used antibiotic in hospitals was Ciprofloxacin (23%), followed by Gentamycin (15%), Sulfonamide (14%), Enrofloxacin (13%), Macrolide (Tilmicosin) (12%), Liso-vit (with Ciprofloxacin) (10%), Liso-vit (8%), and Toltrazuril (5%). This slightly differs from the previous study (Akter *et al*., 2025b). In this study, a minimal combination of antibiotics was reported for disease treatment. In most cases, only one antibiotic, particularly Ciprofloxacin (23%), was used for the majority of disease cases. For bacterial infections in poultry, such as *Salmonella*, *Escherichia coli*, and respiratory diseases caused by Mycoplasma, antibiotics including Ciprofloxacin and Enrofloxacin are employed. Gentamycin is also used for severe infections, such as septicemia and other systemic bacterial infections. Tilmicosin (a macrolide) is used to treat respiratory diseases in poultry caused by *Pasteurella* or *Mycoplasma* species. Sulfonamides are effective against other respiratory and gastrointestinal infections, particularly those caused by bacteria of the genus Haemophilus. Liso-vit is utilized to treat mixed bacterial infections in combination with Ciprofloxacin. Conversely, Toltrazuril is primarily used to treat Coccidiosis, a common parasitic disease that affects poultry and can cause severe gastrointestinal illness.

5. Conclusions

This study found that respiratory and digestive diseases, primarily bacterial and viral, are the most common among poultry in Jamalpur. Broilers were significantly affected by IBD and visceral gout, while layers and Sonali chickens were impacted by ND. Desi chickens suffered from coccidiosis, ducks were affected by cholera, and pigeons experienced salmonellosis. Ciprofloxacin was the most frequently used medication. However, gaps remain in understanding seasonal disease trends, drug efficacy, and antimicrobial resistance, highlighting the need for further research and improved disease management strategies.

Acknowledgements

The Faculty of Animal Science and Veterinary Medicine, Sher-e-Bangla Agricultural University, Dhaka for providing Internship placement in Jamalpur district. Special thanks to Dr. Mohammad Mazaharul Islam, Veterinary Surgeon, District Veterinary Hospital, Jamalpur, the Government Republic of Bangladesh. The research received no specific grant from any funding agency.

Data availability

The data presented in this study are contained in this manuscript.

Conflict of interest

None to declare.

Authors' contribution

Arnab Kumer Sutra Dhar: conceptualization, designed the study, involved in necropsy examination and records postmortem findings for the diagnosis of diseases, organized, analyzed, and interpreted the data, writing original draft and editing; Ashing Yaing Marma: finalized the data, data analysis, manuscript writing and editing; Muhtadi Md. Waliullah: finalized the data, data analysis, manuscript writing and editing; Marium: finalized the data, data analysis, manuscript writing; Md. Mominul Islam: finalized the data, data analysis, manuscript writing, editing and revision of the manuscript; Mst. Sharifa Jahan: finalized the data, data analysis, manuscript writing, editing and revision of the manuscript; Sajeda Sultana: supervision, conceptualization, organized, analyzed, and interpreted the data, writing original draft, editing and revision of manuscript. All authors have read and approved the final manuscript.

References

Abreu R, T Semedo-Lemsaddek, E Cunha, L Tavares and M Oliveira, 2023. Antimicrobial drug resistance in poultry production: current status and innovative strategies for bacterial control. Microorganisms, 11: 953.

Ahmed MS, A Sarker and MM Rahman, 2009. Prevalence of infectious diseases of broiler chickens in Gazipur district. Bangl. J. Vet. Med., 7: 326-331.

Akter S, I Tajkeya and MH Mamun. 2025a. Epidemiological investigation of poultry diseases and prescribed antimicrobials in Kishoreganj based on hospital data. Asian J. Res. Anim. Vet. Sci., 8: 230-248.

Akter S, MK Islam, MAN Sakib and MH Ali, 2025b. Retrospective investigation of duck diseases and their temporal distribution in Sylhet: passive surveillance. Res. Agric. Livest. Fish., 12: 85-92.

Akter S, S Ghosh, SK Biswas, TK Das, NN Chisty, SI Sagor, Gupta SD, MS Uzzaman, AK Karna, F Talukdar and S Chowdhury, 2025c. Biosecurity practices in commercial chicken farms: contributing factors for zoonotic pathogen spread. IJID One Health, 7: 100072.

Alagawany M, SS Elnesr, MR Farag, R Tiwari, MI Yatoo, K Karthik, I Michalak and K Dhama, 2021. Nutritional significance of amino acids, vitamins and minerals as nutraceuticals in poultry production and health – a comprehensive review. Vet. Q., 41: 1-29.

Alam MJ, IA Begum, MAA Mamun, MA Iqbal and AM McKenzie, 2025. The adoption of biosecurity measures and its influencing factors in Bangladeshi layer farms. Discov. Sustain., 6: 29.

Badruzzaman ATM, M Noor, MAL Mamun, M Rahman, A Husna and KM Islam, 2015. Prevalence of diseases in commercial chickens at Sylhet division of Bangladesh. Int. Clin. Pathol. J., 1: 104-108.

Bist RB, K Bist, S Poudel, D Subedi, X Yang, B Paneru, S Mani, D Wang and L Chai, 2024. Sustainable poultry farming practices: a critical review of current strategies and future prospects. Poult. Sci., 103: 104295.

Bupasha ZB, R Begum, S Karmakar, R Akter, A Ahad and S Sarker, 2020. Multidrug-resistant *Salmonella* spp. isolated from apparently healthy pigeons in a live bird market in Chattogram, Bangladesh. World Vet. J., 10: 508-513.

Caneschi A, A Bardhi, A Barbarossa, A Zaghini, 2023. The use of antibiotics and antimicrobial resistance in veterinary medicine, a complex phenomenon: A narrative review. Antibiotics, 12: 487.

Carpenter A, MA Waltenburg, A Hall, J Kile, M Killerby, B Knust, M Negron, M Nichols, RM Wallace, CB Behravesh and JH McQuiston, 2022. Vaccine preventable zoonotic diseases: Challenges and opportunities for public health progress. Vaccines, 10: 993.

Chakma S, 2015. Epidemiology of infectious bursal disease in broiler birds of three districts in Bangladesh. Asian J. Med. Biol. Res., 1: 59-64.

Chauhan RS and D Chandra, 2007. Necropsy and histopathological examination techniques. In: Veterinary Laboratory Diagnosis. Edited by: Chauhan RS and D Chandra, Indian Veterinary Research Institute, pp. 243-269.

Chowdhury S, S Ghosh, MA Aleem, S Parveen, MA Islam, MM Rashid, Z Akhtar and F Chowdhury, 2021. Antibiotic usage and resistance in food animal production: What have we learned from Bangladesh? Antibiotics, 10: 1032.

Hagag D, K El-Shazly, MA El-Aziz, AA El-Latif, HE Sharkaway, W Abdo and M Barakat, 2020. Assessment of anticoccidial efficacy of novel Triazine compound and Sulfaclozine against experimentally induced Caecal Coccidiosis in broiler Chickens. Sains Malaysiana, 49: 2637-2648.

Hassan MK, MH Kabir, MA Al Hasan, S Sultana, MSI Khokon and SML Kabir, 2016. Prevalence of poultry diseases in Gazipur district of Bangladesh. Asian J. Med. Biol. Res., 2: 107-112.

Hosain MS, MA Islam, MM Khatun and RK Dey, 2012. Prevalence and antibiogram profiles of *Salmonella* isolated from pigeons in Mymensingh, Bangladesh. Microbes and Health, 1: 54-57.

Hossain M, N Hoda, MJ Hossen, MM Hasan, SME Rahman and SML Kabir, 2015a. Assessment of bacterial load of poultry meat used at dining hall of Bangladesh Agricultural University campus. Asian J. Med. Biol. Res., 1: 9-16.

Hossain MB, S Chakma and AA Noman, 2015b. Prevalence of infectious and non-infectious diseases in different age groups of commercial layer chicken in Feni district, Bangladesh. Van Vet. J., 26: 35-38.

Islam A, S Islam, S Sultana and R Khatun, 2024. Insights into native chicken farmers: Understanding knowledge, attitudes, and practices on disease and health management in selected regions of Bangladesh. Egypt. J. Vet. Sci., 1: 1-8.

Islam KM, M Forhad Uddin and M Mahmud Alam, 2014c. Challenges and prospects of poultry industry in Bangladesh. Eur. J. Bus. Manag., 6: 116-127.

Islam M, S Singha, JP Belgrad, EMY Hasib, MA Sayeed, ME Haque, A Ahad and MA Hoque, 2021. Common chicken diseases in Kishoreganj, Bangladesh: estimation through the veterinary hospital-based passive surveillance system. Adv. Anim. Vet. Sci., 9: 1951-1958.

Islam MK, MF Uddin and MM Alam, 2014a. Challenges and prospects of poultry industry in Bangladesh. Eur. J. Bus. Manag., 6: 116-127.

Islam SS, S Islam, ZF Siddiqe, RH Shawon, SM Hanif and MA Rahman, 2014b. Diseases of birds and their responses to treatment in different regions of Bangladesh. Int. J. Nat. Soc. Sci., 1: 31-36.

Khalil I, MA Sayeed, M Sarkar, MN Islam, MG Osmani, M Islam, S Chowdhury, MAS Mohsin and MA Hoque, 2024. Web-based passive surveillance: Multifactorial assessment of sonali chicken diseases and antimicrobial prescription pattern in Bangladesh. Vet. Sci., 11: 662.

Khan KA, MA Islam, AAM Sabuj, MA Bashar, MS Islam, MG Hossain, MT Hossain and S Saha, 2021. Molecular characterization of duck plague virus from selected Haor areas of Bangladesh. Open Vet. J., 11: 42-51.

Liu H, S Pan, C Wang, W Yang, X Wei, Y He, T Xu, K Shi and H Si, 2025. Review of respiratory syndromes in poultry: pathogens, prevention, and control measures. Vet. Res., 56: 101.

Mamun AM, KM Islam and MM Rahman, 2019. Occurrence of poultry diseases at Kishoregonj district of Bangladesh. MOJ Proteom. Bioinform., 8: 7-12.

Meher MM, MA Sharif and AA Bayazid, 2022. Seroprevalence of Salmonella spp. infection in different types of poultry and biosecurity measures associated with Salmonellosis. Int. J. Agri. Environ. Food Sci., 6: 557-567.

Parvin R, CK Kabiraj, I Hossain, A Hassan, JA Begum, M Nooruzzaman, MT Islam and EH Chowdhury, 2022. Investigation of respiratory disease outbreaks of poultry in Bangladesh using two real-time PCR-based simultaneous detection assays. Front. Vet. Sci., 9: 1036757.

Rahman M and G Adhikary, 2016. Poultry diseases in some selected areas in Sylhet district of Bangladesh. J. Sylhet Agril. Univ., 3: 1-8.

Rahman MA, MM Rahman, M Moonmoon, KJ Alam and MZ Islam, 2017. Prevalence of common diseases of broiler and layer at Gazipur district in Bangladesh. Asian J. Med. Biol. Res., 3: 290-293.

Rahman MA, MM Rahman, MS Abdullah, MA Sayeed, MH Rashid, R Mahmud, JP Belgrad and MA Hoque, 2019. Epidemiological assessment of clinical poultry cases through the government veterinary hospital-based passive surveillance system in Bangladesh: a case study. Trop. Anim. Health Prod., 51: 967-975.

Roky SA, M Das, S Akter, A Islam and S Paul, 2022. Determinants of Newcastle disease in commercial layer chicken farms in two districts of Bangladesh: a case-control study. Heliyon, 8: e10229.

Saleque MA, MH Rahman and MI Hossain, 2003. A retrospective analysis of chicken disease diagnosed at the BRAC poultry disease diagnostic center of Gazipur. Bangl. J. Vet. Med., 1: 29-30.

Setu SM, MR Prank, MF Ahammed and AL Ahasan, 2025. Factors associated with common prevalent diseases in the Sonali chicken farms of the different regions of Bangladesh: a retrospective study. Trop. Anim. Health Prod., 57: 325.

Srinivasan P, TRG Murthy, K Gopal, S Saravavn and Gowthaman V, 2024. Pathomorphology of acute duck Cholera infection in meat ducks. Indian J. Anim. Res., 2024: 1-5.

Sultana R, B Siddique, R Ali, S Chaudhary and A Maqbool, 2012. A study on the prevalence of respiratory diseases in broiler and layer flocks in and around Lahore district. Punjab Univ. J. Zool., 27: 13-17.

Talukdar ML, FT Zuhra, KME Islam and MS Ahmed, 2017. Prevalence of infectious diseases in Sonali chickens at Bogra Sadar upazila, Bogra, Bangladesh. J. Adv. Vet. Anim. Res., 4: 39-44.