

Common Avian Diseases Diagnosed in Veterinary Teaching Hospital, Usmanu Danfodiyo University Sokoto, Nigeria: A Ten Year (2012–2021) Retrospective Study

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ABSTRACT

A ten-year (2012-2021) retrospective study on clinical records of avian diseases presented at the Avian Unit of Veterinary Teaching Hospital, Usmanu Danfodiyo University Sokoto (VTH UDUS) was conducted. A total of 1,990 cases were recorded. Years 2016 and 2020 recorded the highest number of diseases (310 cases, 15.5%) and lowest number of diseases (27 cases, 1.4%) respectively. On age groups, young birds had 1,361 cases (68.4%) while adult birds had 629 cases (31.6%). Infectious diseases accounted for 1,570 cases (78.9%) while 420 cases (21.1%) were non-infectious diseases. The highest prevalence among the infectious diseases was viral diseases and accounted for 743 cases (47.3%) followed by bacterial diseases 567 cases (36.1%), parasitic diseases 242 cases (15.4%) and fungal diseases 18 cases (1.2%). Among the viral diseases, Avian pox was the most recorded disease 372 cases (50.1%), Aspergillosis was the most prevalent fungal disease with 12 cases (66.7%), while Colibacillosis was the most common bacterial disease with 198 cases (34.9%). Lousiness was the most common parasitic disease with 106 cases (43.8%). With 128 cases (30.4%), heat stress was the most prevalent non-infectious condition. Turkeys were the most recorded types of bird (46.2%), while parrots were the least recorded (0.4%). Poor management may be responsible for distribution pattern of cases recorded in the hospital. Birds owners should always consider good management through consulting veterinarians and there should also be periodic assessment of case records in the VTH in order to have regular updates on level of patronage of the hospital and pattern of occurrence of different diseases.

Keywords: Avian cases, Retrospective study, Veterinary Teaching Hospital UDUS

1.0 INTRODUCTION

Avian species (birds) is a group of warm-blooded animals with certain distinctive features found all over the world. There are over 10,000 species of birds, and they come in many different shapes, sizes, and colors raised mostly for consumption and egg production. (Idahor, 2021). Poultry (species such as chickens, turkeys, ducks and guinea fowls) production is an important aspect of the animal agriculture. It is undeniable fact that the intensification and commercialization of the poultry sector is accelerated by research discoveries in the field of breeding, nutrition, housing management and disease control. Disease is one of the handicaps to successful poultry keeping and should be prevented against always (Hafez and Attia, 2020). Mostly poultry are grouped into age categories as young or adult. In adults, there is replacement of all the juvenile plumage with mature feathers that are longer (especially flight feathers and secondary feathers of the wings) and somewhat more glossy or shiny neck "hackle" feathers on most birds (Smith, 2021).

There are several types of poultry diseases, including respiratory infections, digestive disorders, and other infectious and non-infectious conditions. Symptoms can vary depending on the specific disease. It's crucial to maintain good hygiene, provide proper nutrition, and regularly monitor the health of poultry. Any signs of illness should be followed by appropriate treatment options (Hafez, and Attia2020).

Avian diseases are among the most constraints factors of poultry production. Some diseases continue to persist in an environment due to poor management practices like failure to report cases to appropriate authorities by poultry farmers and misuse of antimicrobials which in turn leads to antimicrobial resistance (Habiba *et al.*, 2023). Also, emerging and reemerging avian diseases change the dynamics of the existing diseases pattern which eventually alter existing reports.

According to last retrospective study in the VTH UDUS by Ibitoye *et al.*, (2013), avian diseases recorded between 2007 and 2011 were 2,624 with Newcastle disease having the highest occurrence. The importance of record

keeping is serving as a guide to knowledge of recorded diseases in a particular area which helps in research and providing a control strategy. There is dearth of information on comprehensive report on avian cases handled in the VTH UDUS for a period of time. Thus, having an updated record of these diseases is empirical.

2.0 MATERIALS AND METHOD

2.1 Study Area

The study was conducted in Veterinary Teaching Hospital Usmanu Danfodiyo University Sokoto (VTH UDUS) where data was collected. VTH is located in City Campus Complex UDUS. Sokoto state is one of the 36 states of Nigeria. It is situated in the Northwestern savannah vegetation belt bordered by Niger Republic, Kebbi state and Zamfara state to the North, South and East respectively and located near the confluence of the Sokoto River and the Rima River. The state is located to the extreme North-western part of Nigeria between 4.8°E and 6.54°E Longitudes and 12°N and 13.58°N Latitudes. Its capital and largest city is the city of Sokoto. It had an estimated population of more than 6.3 million people at 2022 with an annual average temperature of 28.3 °C (82.9 °F). In this savannah zone, small scale poultry production predominates in over 80% of families in the community as a source of investment, manure and meat at home and during festivals which might be kept intensively or semi-intensively in the compounds with some additional supplements from the owners (Wikipedia, 2024).

2.2 Study Design

The study was designed to collect data from case file records in the Avian Unit of the VTH UDUS, and to cover ten-year period of 2012-2021.

2.3 Data Collection

Retrospective data on clinical cases of common avian diseases among the poultry presented at the Veterinary Teaching Hospital for ten years (2012-2021) was collected. The signalment of the patients including species, type/breed and age and also diagnosis were recorded. Diagnosis at the Veterinary Teaching Hospital is usually based on history, clinical observation as well as necropsy findings and laboratory investigations. Diagnostic imaging is also another technique used in confirming diagnosis. Cases were grouped considering record year, age group of bird, type of disease and type of bird.

2.4 Data Analysis

The data dealing with recorded avian diseases were carefully analyzed, computed and expressed using descriptive statistics such as frequencies, percentages,

charts and tables using SPSS version 22 statistical software.

3.0 RESULTS

The total number of avian cases recorded between 2012 and 2021 was 1,990. Based on yearly distribution of avian diseases, the year 2012 had the occurrence rate of 165 cases (8.3%), 2013 216 cases (10.9%), 2014 132 cases (6.6%), 2015 236 cases (11.9%), 2016 310 cases (15.5%), 2017 225 cases (11.3%), 2018 244 cases (12.3%), 2019 223 cases (11.2%), 2020 27 cases (1.4%) and 2021 212 cases (10.6%) as shown in figure 1.

The year with highest number of recorded cases is 2016 with 310 cases (average of 26 cases monthly) while the year 2020 had the least number of recorded cases. STATEMENT HERE HAS BEEN DELETED

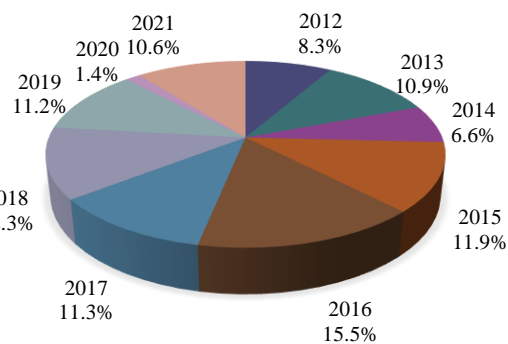


Figure 1: Yearly Distribution of Recorded Avian Diseases in VTH UDUS from 2012 to 2021

On the prevalence rate of avian diseases among different age groups of birds in the ten year records, young birds had 1,361 cases (68.4%) while adult birds had 629 cases (31.6%) as shown in figure 2.

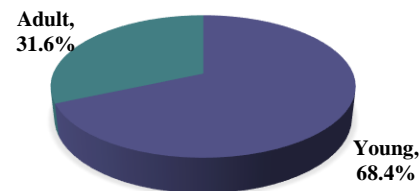


Figure 2: Prevalence Rate of Recorded Avian Diseases in VTH UDUS among Age Groups from 2012 to 2021

Out of the total number of avian cases recorded between 2012 and 2021, infectious diseases had the prevalence rate of 78.9% (1,570 cases) while non-infectious diseases

had the prevalence rate of 21.1% (420 cases) as shown in figure 3.

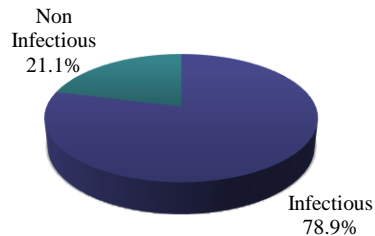


Figure 3: Prevalence Rate of Infectious and Non-Infectious Avian Diseases Recorded in VTH UDUS from 2012 to 2021

From the overall infectious diseases recorded (1,570), viral diseases had the prevalence rate of 47.3% (743 cases), bacterial diseases had the prevalence rate of 36.1% (560 cases), parasitic diseases had the prevalence rate of 15.4% (242 cases) and fungal diseases had the prevalence rate of 1.2% (18 cases) as shown in table 1.

Table 1: Prevalence Rate of Recorded Infectious Avian Diseases in VTH UDUS from 2012 to 2021 based on causative agent

Causative agent	Number of cases	Prevalence (%)
Virus	743	47.3
Bacteria	567	36.1
Parasite	242	15.4
Fungus	18	1.2
TOTAL	1,570	100

Among all the recorded viral diseases, Fowl pox had the highest occurrence with prevalence rate of 50.1% (372 out of 743). Colibacillosis had the highest occurrence among bacterial diseases with prevalence rate of 34.9% (198 out of 567). Among parasitic diseases, Lousiness had the highest occurrence with prevalence rate of 43.8% (106 out of 242). Aspergillosis had the highest occurrence among the fungal diseases with prevalence rate of 66.7% (12 out of 18). Table 2 presents diseases with the highest prevalence rate by causative agents.

Table 2: Prevalence Rate of Most Occurring Infectious Diseases Based on Causative Agent

Causative agent	Number of cases	Highest Recorded disease	Number of cases	Prevalence (%)
Virus	743	Fowl pox	372	50.0
Bacteria	567	Colibacillosis	198	34.9
Parasite	242	Lousiness	106	43.8
Fungus	18	Aspergillosis	12	66.7

From the overall non-infectious diseases recorded (420), heat stress had prevalence rate of 30.4% (128 cases), cannibalism had 26.7% (112 cases), fracture 13.8% (58 cases), joint luxation/slipped tendon had 12.4% (52 cases), cloacal prolapse 6.9% (29 cases), skin wound (cuts, abrasions and lacerations) was 3.8% (16 cases), and egg binding 1.0%, (4 cases), other diseases like rickets, pododermatitis, subcutaneous emphysema etc 5% (21 cases) as shown in table 3.

Table 3. Prevalence Rate of Recorded Non-infectious Avian Diseases in VTH UDUS from 2012 to 2021

Condition	No. of cases	Prevalence (%)
Heat stress	128	30.4
Cannibalism	112	26.7
Fracture	58	13.8
Luxation/slipped tendon	52	12.4
Cloacal prolapsed	29	6.9
Skin wound	16	3.8
Egg binding	4	1.0
Others	21	5.0
TOTAL	420	100

On the prevalence rate of recorded avian diseases among different types of birds, cases of turkeys were 920 (46.2%), chicken had 881 cases (44.3%), pigeons 55 cases (2.8%), guinea fowls 44 cases (2.2%), geese 32 cases (1.6%), ostriches 28 cases (1.4%), peacocks 22 cases (1.1%) and parrots had 8 cases (0.4%) as indicated in table 4.

Table4: Prevalence Rate of Most Recorded Avian Diseases among Different Types of Birds in VTH UDUS from 2012 to 2021

Species	Number of cases	Prevalence (%)
Turkey	920	46.2
Chicken	881	44.3
Pigeon	55	2.8
Guinea fowl	44	2.2
Geese	32	1.6
Ostrich	28	1.4
Peacock	22	1.1
Parrot	8	0.4
Total	1,990	100

4.0 DISCUSSION

A total of 1,990 cases of avian diseases were documented in the ten- year records in VTH UDUS. The number was obtained considering avian cases managed at VTH that had tentative/confirmatory diagnosis. Some diseases are not reported in this work either because they were not concluded due to death of the presented patient and/or lack of compliance by clients to allow cases to be handled to logical conclusion such as taking samples for analysis and conducting postmortem examination. This is mostly as a result of financial constraint. Also from the last retrospective study conducted in the VTH UDUS on Newcastle disease by Ibitoye *et al.* (2013), there were 2,624 total avian cases in the five-year study period (2007-2011). Similarly, Balamiet *et al.* (2014) reported a total of 2,317 cases of poultry diseases documented during nine-year study period from clinical records from University of Maiduguri Veterinary Teaching Hospital and State Veterinary Hospital Maiduguri. The higher number obtained in the study may be as a result of wider coverage of poultry diseases record in the state comprising of records from both VTH and the state veterinary hospital.

The year 2016 had the highest rate of occurrence of avian diseases in VTH (15.5%) and 2020 had the lowest rate of occurrence (1.4%). The highest number of cases recorded in 2016 could not be attributed to a particular reason while lowest number of cases obtained in the year 2020 could be associated with COVID 19 national/global lockdown when the VTH UDUS was closed for months. Ibitoye *et al.* (2013), in five-year study, reported that highest number of cases (524) was obtained in 2011 which is higher than the highest number (310) in 2016 and the average number (199) obtained in this study. This may be as a result of decreased patronage of veterinary hospitals/clinics by poultry handlers. The low patronage is not unconnected with persistent economic hardship experienced by most low-income earners in the study area and beyond so they opt for cheaper services from nonprofessionals. It is evident in the VTH UDUS that clients don't usually comply with the hospital for proper investigations in the process of management of cases as a result of financial involvement in doing so.

Young birds had higher number of recorded diseases with occurrence rate of 68.4% while adult birds had occurrence rate of 31.6%. This may be associated with inadequate developed immunity in young birds compared to older ones as reported by Tamiru *et al.* (2019) that generally young birds are more susceptible to severe infections.

Infectious diseases had higher occurrence rate of 77.4% while non-infectious diseases had lower rate of 22.6%. This may be attributed to contagious nature of many infectious diseases and intensive system of management of commercial birds which allows close contact and eventually facilitates spread of diseases between them.

Among the infectious diseases recorded in the hospital, viral diseases had the highest number (743, 47.1%), this may be due to the fact that viral diseases are more difficult to control compared to other diseases as reported by Yadav *et al.* (2020). Among the viral diseases, fowl pox had the highest prevalence (50.0% out of all the viral diseases). Ibitoye *et al.* (2013) in the last retrospective studies on avian cases in VTH UDUS, reported Newcastle disease to be the most occurring disease with prevalence rate of (80.9%). Adamu *et al.* (2009) reported Infectious Bursal Disease to be the most commonly diagnosed disease in Sokoto (32.9%). These are contrary to the findings of this work. The highest prevalence of fowl pox among other viral diseases in this study may be associated with increased back yard poultry turkey rearing practice in the study area. Local turkey farming which is in the increase is not given proper management attention and care in terms of vaccination and biosecurity compared to commercial chicken raising which is also in the increase, this predisposes turkeys to common endemic diseases. This is also related to the nature of more exposed integument (wattles) of turkeys which makes insects get more access hence more infection by the virus through mechanical means. Lack of request for vaccination against the disease in the study area compared to other diseases like ND and BD is another contributing factor of increased number of avian pox in chickens and in turkeys especially, together with difficulty in vector control (mostly mosquitoes).

Bacterial diseases were second in occurrence with prevalence of 36.1%. Colibacillosis had the highest rate of occurrence (34.9% out of all the bacterial diseases). The higher rate of occurrence may be associated with lack of good sanitary hygiene, unavailability of vaccines; all ages of birds being susceptible and both horizontal and vertical ways of transmission of the disease. The disease also has various forms affecting many systems with many pathogenic strains involved and the reports of antimicrobial resistance which results in increased failure rate in treatment of Avian Colibacillosis as reported by Pereira *et al.*, (2024). This is similar to the report of Balamiet *et al.* (2014) in Maiduguri where Colibacillosis was the bacterial disease with the highest rate of occurrence though with a lower frequency of 10.5%.

Parasitic diseases were third in occurrence with (15.4%). Among the parasitic diseases, Lousiness had the highest

number among others (43.8% out of all the parasitic diseases), this may be associated with poor housing and hygiene and also direct contact mode of transmission which makes the parasites easy to spread especially in a deep litter house where birds are closely kept and difficult to control in free range birds. A report by Mbah-Omeje, (2024) on ectoparasitic profile of chicken in Agbani, Enugu State, Nigeria showed that out of the 300 chickens sampled 130 (43.3%) were found positive with ectoparasites. Lice and mite were identified with lice having higher occurrence. This is similar to the finding of this work. Fungal diseases were the fourth and the least documented infectious disease with prevalence rate of (1.2%). Aspergillosis is the highest recorded fungal disease which is usually associated with inhalation of fungal conidia in moldy feed; tropical areas have more favorable environmental conditions for the growth and proliferation of this fungal agent in the environment (Pazos *et al.*, 2022).

Among the non-infectious diseases recorded, Heat stress had the highest occurrence (30.4%), which is common due to climatic condition of the study area with high temperatures during heat period, followed by Cannibalism (26.7%) which happens as a result of many different management factors. Fracture which could be associated with nutritional deficiencies e.g. minerals deficiency and or metabolic diseases like calcium and phosphorus imbalance, mis-handling of birds during catching and also heavy nature of ostriches that were reported with such conditions had (13.8%). Bones dislocation/slipped tendon mostly due to trauma/nutritional deficiencies had rate of (12.4%), skin wound (cuts, abrasions and lacerations) commonly presented in female turkeys reported to occur as a result of mating and as a result of other causes including presence of injurious objects in poultry houses had the rate of (8.8%). Cloacal prolapse had the rate of (6.9%). Egg binding had the rate of (1.0%). Other diseases like rickets, pododermatitis, subcutaneous emphysema etc, accounted for 5% (21 cases).

Among the 1,990 cases recorded, turkeys had occurrence rate of (46.2%), followed by chicken with (44.3%). Other types of birds in record are guinea fowl (2.2%), Pigeon (2.8%), geese (1.6%), ostrich (1.4%), peacock (1.0%), and parrot (0.4%). This is contrary to the report of Ibitoye *et al.*, (2013), where layer birds had the highest record. The higher number of cases in turkeys may be due to increase in backyard raising of poultry where turkeys have high number as well as failure to always consider these types of birds for vaccination.

5.0 CONCLUSION

The findings show that a high incidence of infectious diseases was linked to subpar management, which is

related to insufficient knowledge of poultry immunizations and financial hardships that ultimately lead to self-medication and decreased consultation of veterinarians.

6.0 RECOMMENDATION

The authors recommend that there should be periodic assessment of case records in the VTH in order to have regular updates on level of patronage of the hospital and pattern of occurrence of different diseases. So also, there is need for creating awareness through sensitization on importance of consulting veterinarians dangers associated with self medication.

7.0 ACKNOWLEDGEMENT

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REFERENCES

- Adamu, Y.A., Ahmed, A.B., Abubakar, M.B. and Lawal, M.D. (2009). A retrospective study (2004-2008) of poultry diseases diagnosed in veterinary teaching hospital (VTH), Usmanu Danfodiyo University Sokoto (UDUS) and Sokoto Veterinary Centre (SVC), Sokoto State, Nigeria. *International Journal of Animal and Veterinary Advancement*, 1: 15-17.
- Balami, A.G., Ndahi, J.J., Zaifada, A.U., Mustapha, M. and Jarafu, D.J. (2014). A Retrospective Study of Poultry Diseases Diagnosed in Maiduguri, North-East, Nigeria. *Poultry, Fisheries and wildlife Sciences* 2: 113. Pg. 4 of 4 Volume 2.
- Habiba, U.E., Khan, A., Mmbaga, E.J., Green, I.R., Asaduzzaman, M. (2023). Use of antibiotics in poultry and poultry farmers- a cross-sectional survey in Pakistan. *Front Public Health*. 11;11:1154668. doi: 10.3389/fpubh.2023.1154668. PMID: 37497033; PMCID: PMC10366442.
- Hafez, H.M., Attia, A. (2020). Challenges to the Poultry Industry: Current Perspectives and Strategic Future After the COVID-19 Outbreak. *Front Veterinary Science* PMID: 33005639, PMCID: PMC7479178, doi: 10.3389/fvets.2020.00516.
- Ibitoye, E.B., Jimoh, A.A. and Mungadi, H.U. (2013). A Retrospective (2007-2011) analysis of Newcastle disease diagnosed at Avian clinic of VTH, Usmanu Danfodiyo University Sokoto, Nigeria. *Current research in poultry science* 3(1):12-17.
- Idahor O.K. (2021). Avian Reproduction. *Veterinary Medicine and Science*. Available from: <http://dx.doi.org/10.5772/intechopen.101185>.
- Mbah-Omeje, K.N. (2024). Ectoparasitic profile of apparently healthy chicken in Agbani, Enugu State, Nigeria. *World Journal of Advanced Research and Reviews*, 21(02), 683–691 Article DOI: <https://doi.org/10.30574/wjarr.2024.21.2.0871>.



- Pazos Bucheli, L.M. Ríos Elejalde, L.M. Morales, A.J. (2022). Aspergillosis in Birds: A Systematic Review and Meta-Analysis. Bachelor's Thesis, Universidad Tecnológica de Pereira, Pereira, Colombia, 2018. Available online: <https://repositorio.utp.edu.co/server/api/core/bitstreams/6a78a048-2334-4f4b-83aa-9a86f5ba9f21/content>.
- Pereira, A., Hanna, E. Sidjabat, S.D., Paulo, G.V., Amalia, A., Cristibela, D., Joanita, B. J., Felisiano, C., Natalino, F., Augusta, X. and et al. (2024). "Prevalence of Antimicrobial Resistance in Escherichia coli and Salmonella Species Isolates from Chickens in Live Bird Markets and Boot Swabs from Layer Farms in Timor-Leste" *Antibiotics* 13, no. 2: 120. <https://doi.org/10.3390/antibiotics13020120>.
- Smith, C. (2021). *The Biology of Moulting in Birds* by Lukas Jenni and Raffael Winkler, 2020. [book review]. *The Canadian Field-Naturalist* 135(1):90-91 DOI:10.22621/cfn.v135i1.2845.
- Tamiru, N. A., Alexander, Y., Douglas, C. H., Raveendra, R. K., Khaled, T. & Shayan, S. (2019). Development of innate immunity in chicken embryos and newly hatched chicks: a disease control perspective, *Avian Pathology*, 48:4, 288-310, DOI: 10.1080/03079457.2019.1607966.
- Wikipedia (2024). "Sokoto State: Subdivision" @ www.citypopulation.de, Retrieved 7 February 2024.
- Yadav, M.P., Singh, R.K., Malik, Y.S. (2020) Emerging and Transboundary Animal Viral Diseases: Perspectives and Preparedness. *Emerging and Transboundary Animal Viruses*. Springer Nature, 23:1–25. doi: 10.1007/978-981-15-0402-0_1. PMID: PMC7123659.