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# Retrospective Study Of Infectious Bronchitis In Fct, Nigeria

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**ORGINAL ARTICLE**

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## Abstract

The growing number of Infectious Bronchitis (IB) outbreaks prompted this retrospective investigation. The purpose was to ascertain the frequency and distribution of the disease in poultry farms over a eight (8) years period (2017-2024) in FCT, using case file records. 90.7% was the overall prevalence was recorded for Infectious Bronchitis (IB) within the study area during the period under review. The year 2024 has the highest prevalence which was 96.8% and 16.1% difference from the least prevalence recorded in 2018. This is suggestive of the increase in the activities of the virus within the state. Continuous surveillance was recommended in addition to timely vaccination and sero- profiling prior to all vaccination. Biosecurity knowledge among chicken farmers, hatcheries, and other relevant stakeholders is also required.

**Key words:** Prevalence, Infectious Bronchitis, Poultry, FCT, Nigeria

## 1. Introduction

Infectious bronchitis virus is an enveloped, single-stranded RNA coronavirus that causes infectious bronchitis (IB), a disease that can result in significant financial losses to chicken farmers (Cavanagh, 2007 and Sjaak de Wit *et al.*, 2011).

This encapsulated, positive-strand RNA virus has been connected to respiratory diseases and has been identified in the chicken's kidneys, numerous oviducts, and digestive system (Awad *et al.*, 2014; Benyeda *et al.*, 2009; Ganapathy *et al.*, 2012).

It has been shown to have negative effects on egg quality and production as well as a noticeable slowdown in growth, especially in laying birds (Cavanagh *et al.*, 2003). The term "infectious bronchitis" refers to the disease's respiratory symptoms, which are the most noticeable. Rales, gasping, and sneezing are some of these symptoms, sometimes along with lacrimation and facial swelling (Jordan and Pattison 1999). The infectious bronchitis virus is found in faeces, respiratory secretions, and infected eggshells. It can persist in faeces for a very long time.

Ingestion of contaminated feeds and water, contact with infected birds, and airborne droplets
are all ways that this virus is spread. Infected caretakers' clothing and equipment can also spread the disease (Cavanagh, 2008).

IB disease in chicken has become well known due to its impact on production and meat and egg quality. Production-related losses are typically more alarming than mortality-related losses.

Attempts to prevent IBV have become more difficult and expensive due to the disease's highly transmissible nature and the existence of numerous serotypes (Cavanagh and Naqi, 2003; and Cavanagh, 2005). Adene and Ojo (1976) were the first to establish the

incidence of IB in chickens in Nigeria, and more reports have confirmed the existence of the disease within the country. Serological evidence of IBV prevalence was found in Eastern Nigeria in the early 1990s (Komolafe *et al.*, 1990). Afterwards, 1059 commercial chickens in the southwest of the country showed an 84% seroprevalence of the virus (Ducatez *et al.*, 2004; Owoade *et al.*, 2006). Three northern Nigerian states had antibodies to the avian infectious bronchitis virus, according to Musa *et al.*, (2017). Since these bird species are not vaccinated, he hypothesized that they are exposed to the virus naturally. Other research carried out in the north central area are Ameh *et al.*, 2016, Shittu *et al.*, 2019, Ijoma *et al.*, 2020, and Agbato *et al.*, 2023, are among the other studies conducted in the north central area. The growing number of Avain Infectious Bronchitis disease (IB) outbreaks necessitated this retrospective study. The purpose of this was to ascertain the distribution and prevalence of the disease in poultry farms over a period of eight (8) years (2017-2024) in FCT using case file records. The design and implementation of IB prevention in the Federal Capital Territory and across Nigeria will benefit from this information.

## MATERIALS AND METHODS

### 2.1. Study area

The Federal Capital Territory (FCT) in Abuja is where the study was conducted. The position lies between longitude 7.580 East and latitude 9.060 North. Abuja has a land area of 8,000 square kilometers and is located in the center of Nigeria. It shares borders with the states of Kogi on the south-west, Nasarawa on the east and south-east, Kaduna on the north, and Niger on the west.

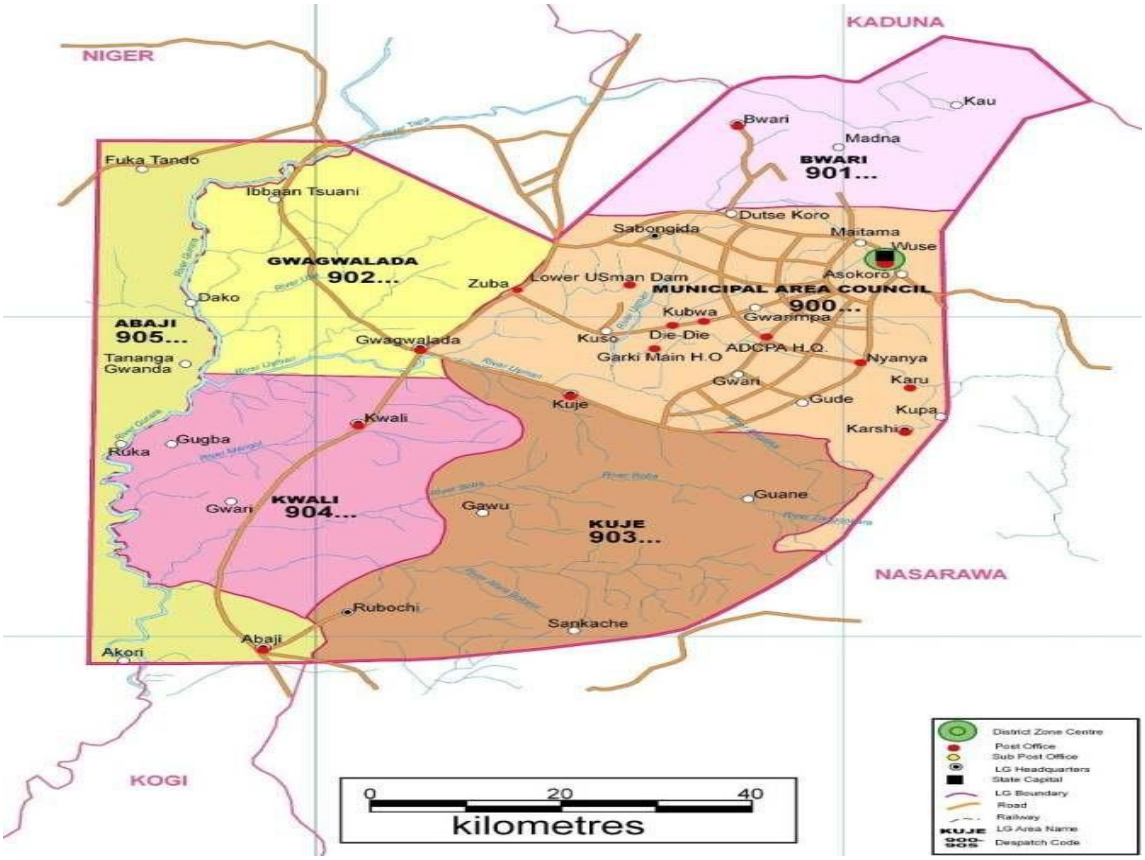


Figure 1: Map showing the study location

**2.2 Case file records**

Monthly reports of Infectious bronchitis disease spanning 8 years starting from January 2017 to December 2024 were gathered from case files and post-mortem records and serological test report in Animal Care Lab Abuja Laboratory. Proportional (percentage) data presentation was used to compile and analyze the data as shown in table 1, 2, 3 and 4. This data were analyzed to establish prevalence of IB in birds.

**2.3 Serological test**

The screening of sera for infectious bronchitis virus antibodies was done using an indirect enzyme-linked immunosorbent assay (ELISA) where the kits were obtained from IDEXX laboratories, Maine, USA. The method described by Shetimma *et al*., (2016) was used. Each sample was diluted five hundred times (1:500) with sample diluent in a dilution well. 100 µL of undiluted negative and positive controls were dispensed in duplicate wells. 100 µL of diluted sample was poured into appropriate wells and incubated for 30 minutes at 18-26°C. The liquid content of all the wells was aspirated into the appropriate waste reservoir and the well was washed 3-5 times with about 350 µL of distilled water before being completely aspirated. Following that, 100 µL of Conjugate was dispensed into each well and incubated for 30m minutes at 18-26°C. All the liquid from the wells was aspirated into an appropriate waste reservoir and the well was washed 3-5 times; after which 100 µL of TMB Substrate was dispensed into each well and incubated for 15 minutes at 18-26°C and 100 µL of Stop solution was added to stop further reaction. The absorbance of the plate was read at 650nm using a Biotek EL×800 microtitre plate reader to obtain the optical density.

## 3.0 RESULTS

The total number of samples received for suspected cases of Infectious bronchitis was 280 cases but the total number of confirmed cases was 254 (90.7%) as seen in table 3. The annual distribution of IB cases shows that it was 84.4% 2017, 80.7% in 2018, 92.3% in 2019, 95.2% in 2020, 90.0% in 2021, 91.4% in 2022, 94.4% in 2023 and 96.8% in 2024 as seen in table 2.

**Table 1: Annual distribution of suspected cases of IB reported within the period under review**

| | January | Feb | March | April | May | June | July | August | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2017 | 4 | 1 | 2 | 1 | 5 | 4 | 3 | 0 | 2 | 5 | 4 | 1 | 32 |
| 2018 | 9 | 4 | 0 | 1 | 3 | 1 | 3 | 2 | 3 | 5 | 0 | 0 | 31 |
| 2019 | 0 | 1 | 2 | 0 | 2 | 2 | 1 | 3 | 0 | 0 | 2 | 0 | 13 |
| 2020 | 3 | 1 | 2 | - | - | 4 | 2 | 0 | 7 | 2 | 0 | 0 | 21 |
| 2021 | 5 | 3 | 4 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 30 |
| 2022 | 3 | 3 | 4 | 2 | 6 | 5 | 3 | 4 | 1 | 3 | 3 | 0 | 37 |
| 2023 | 4 | 5 | 3 | 7 | 4 | 8 | 5 | 6 | 5 | 4 | 2 | 1 | 54 |
| 2024 | 5 | 6 | 1 | 5 | 8 | 3 | 7 | 8 | 7 | 5 | 4 | 3 | 62 |

**Table 2: Monthly distribution of confirmed IB cases in poultry within Abuja**

| | January | Feb | March | April | May | June | July | August | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2017 | 3 | 1 | 2 | 1 | 3 | 4 | 2 | 0 | 2 | 4 | 4 | 1 | 27(84.4%) |
| 2018 | 7 | 3 | 0 | 1 | 2 | 1 | 3 | 1 | 2 | 5 | 0 | 0 | 25(80.7%) |
| 2019 | 0 | 1 | 2 | 0 | 2 | 1 | 3 | 1 | 0 | 2 | 0 | 0 | 12(92.3%) |
| 2020 | 3 | 1 | 2 | - | - | 4 | 2 | 0 | 6 | 2 | 0 | 0 | 20(95.2%) |
| 2021 | 4 | 1 | 4 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 27(90.0%) |
| 2022 | 3 | 3 | 1 | 2 | 4 | 5 | 3 | 4 | 1 | 3 | 3 | 0 | 32(91.4%) |
| 2023 | 4 | 4 | 3 | 6 | 4 | 7 | 5 | 6 | 5 | 4 | 2 | 1 | 51(94.4%) |
| 2024 | 5 | 6 | 1 | 5 | 6 | 3 | 7 | 8 | 7 | 5 | 4 | 3 | 60(96.8%) |
| | 29 | 20 | 15 | 18 | 23 | 27 | 27 | 23 | 25 | 27 | 14 | 6 | 254(90.7) |

**Table 3: Prevalence of Infectious Bronchitis according to type of birds Based on Restropective Study.**

| Bird Type | Total samples | No of positive | Prevalence Percentage |
|---|---|---|---|
| Layers | 162 | 150 | 92.6 |
| Pullets | 92 | 78 | 84.78 |
| Broilers | 26 | 26 | 100 |
| Total | 280 | 254 | 90.7 |

## 4.0 DISCUSSION

Over the course of the review period, the research area's total prevalence of infectious bronchitis (IB) was 90.7%. This is slightly higher than the 80.56% recorded by Agbato *et al*., 2023 and that of 84% from Sokoto (Mungadi *et al.,* 2015) and 82.95% from Plateau state (Ijoma *et al.*, 2020) . Between 2017 and 2024, the number of IB cases reported showed an undulating occurrence, according to the annual distribution (84.4%, 80.7%, 92.3%, 95.2%, 90.0%, 91.4%, 94.4%, and 96.8%, respectively). The year 2024 had the highest prevalence which was 96.8% and 16.1% difference from the least prevalence recorded in 2018. This is suggestive of the increase in the activities of the virus within the state. No record was available for cockerel but broilers amidst layers and pullets had the highest percentage of prevalence, even though the number of cases for broilers was small but all came out positive to give 100% prevalence, this could be due to non-practice of IB vaccination in most farms for broilers because of their short life span. It was observed that the period of November and December in 2018 and 2019 and likewise December 2022 had no cases at all, this coincides with the festive period when farmers prefer to sell of their birds, hence they pay little attention to diagnosis of disease of their chicken since they have the option of quick sales. No case was presented to the laboratory within the period of April and May 2020, due to restriction of activities by lockdown during the COVID-19 pandemic.

## 5.0 Conclusion

This study validates the presence of IB within this particular area of study and provides data on prevalence and other risk factors. To effectively prevent the spread of IB, it is advised that continuous surveillance is conducted, timely vaccination is implemented, and stock profiling is carried out before administering any vaccinations. Farm biosecurity and good routine management practices should be implemented, and more awareness campaigns among poultry farmers will help reduce the disease's burden.

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