

# A 9 Year Retrospective Analysis of Veterinary Surgical Cases in Selected Cities of North-Western Nigeria

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## ABSTRACT

Veterinary medical records are essential for evaluating surgical procedures and predicting outcomes. This study analyzed veterinary surgical records over a nine-year period (2015–2024) from Sokoto, Birnin-Kebbi, and Gusau in North-Western Nigeria. A total of 6,088 surgical case records were reviewed from government-owned and registered veterinary hospitals and clinics. Surgical cases were categorized into cosmetic, gastrointestinal, musculoskeletal, reproductive, and ear, nose, and throat (ENT) procedures. Data were analyzed by year, quarter, month, species, sex, and age. Surgical burden peaked in Sokoto in 2017 and in Birnin-Kebbi and Gusau in 2023. The first quarter consistently recorded the highest caseload, particularly in January and February, while the second quarter especially May had the lowest. Musculoskeletal surgeries were the most common (67.08%), while ENT surgeries were the least (1.12%). Ovine species predominated, whereas no surgical cases were recorded in porcine species. More females (46.16%) than males underwent surgery, with 12% of records had no gender data. Adult animals accounted for 55.29% of surgical patients. Pre-anaesthetic assessments were absent in 98.28% of cases, and anaesthetic protocols were unrecorded in 93.63%. post-operative care was only documented in 93.18% of cases. This study provides reference data on the prevalence of profiled surgical conditions and also highlights the urgent need to employ electronic medical records keeping system, standardized protocols, and improved documentation practices through staff training and targeted intervention strategies in veterinary healthcare in the region.

**Keywords:** Profile, Prevalence, Retrospective, Surgical cases, North-western Nigeria.

## 1.0 INTRODUCTION

Veterinary surgery plays a pivotal role in addressing health challenges in animals, improving their welfare, and enhancing livestock productivity (Salau, 2021). It involves manual procedures performed by veterinary surgeons to treat injuries and diseases (Seah, 2001). To ensure proper procedures are followed and to facilitate ongoing improvement, surgical outcomes should be consistently recorded and evaluated. Record-keeping is a vital component of animal health programs, as it enables the tracking of both physical and behavioral health events (FASS, 2020).

Retrospective studies based on existing medical records have been a legitimate method in Africa and around the world for assessing surgical procedures and determining their prevalence (Reichler, 2008). However, the scarcity of such data in sub-Saharan Africa has hindered research efforts and the advancement of evidence-based clinical practices in the region (Jones et al., 2020; King et al., 2020), limiting the feasibility of retrospective research. Despite the increasing number of veterinary practices, there remains a significant lack of comprehensive documentation of surgical cases in Nigeria (Unamba-Oparah et al., 2018).

In Nigeria, existing research has largely focused on the prevalence of specific surgical procedures or conditions in particular species (Ajala & Femi 2011; Uwagie-Ero et al., 2020; Bodinga et al., 2020). Although Unamba-Oparah et al. (2018) conducted a comprehensive review of surgical cases in southeastern Nigeria, there remains a significant gap in the literature regarding a holistic profiling of surgical cases in the north-western region. Important to note, this region houses the largest livestock population in Nigeria accounting for 48.21%, making it a critical area for veterinary services and research (Aminu et al., 2024). Many factors contribute to the under-research of this region. These include limited access to research funding and infrastructure, security challenges due to ongoing conflicts or insurgency in parts of the region and shortage of veterinary research centers with capacity to conduct large-scale studies. (Mohammad, 2020). Additionally, inadequate record-keeping practices in rural veterinary clinics and nomadic livestock management systems further hinders data collection and analysis.

Despite the region's significant reliance on livestock for economic and social livelihoods, data on veterinary surgical cases remain scarce. This hinders effective planning and resource allocation, limits understanding

of prevalent surgical conditions, and undermines the efficiency of veterinary services considering the critical role of surgical interventions in promoting animal health and productivity (Holloway et al., 2023), there is an urgent need for systematic, region-specific research to guide targeted interventions and policy development in North-Western Nigeria.

This retrospective study aims to profile surgical cases presented to veterinary clinics in selected cities of north-western Nigeria. By analysis of clinical records, the study identifies prevalent surgical conditions, the species most commonly affected, and treatment outcomes. The findings gained will enhance understanding of regional veterinary surgical trends, guiding resource allocation, staff training, and intervention strategies in veterinary healthcare in the region.

## 2.0 MATERIALS AND METHODS

### 2.1 Study Area

This study was conducted in the capital cities of Sokoto, Birnin-Kebbi, and Gusau in northwestern Nigeria. These states lie within the Sudan and Sahel Savannah ecological zones and are characterized by a hot, semi-arid climate with prolonged dry seasons and brief, irregular rainfall from June to September (NiMet, 2021). These climatic extremes particularly high temperatures, dust storms, and limited rainfall adversely affect both livestock health and the delivery of veterinary services. Access to veterinary care in these cities is constrained by rural-urban disparities, limited infrastructure, and seasonal mobility challenges, which hinder the timely and consistent provision of animal healthcare. Although the combined population of these states exceeds 13 million and there is a high concentration of livestock, particularly small ruminants, veterinary services remain largely centralized in urban areas (FAO, 2022). Rural communities, where livestock farming is most concentrated, are often underserved due to the concentration of veterinary facilities in urban centers (Mohammed, 2020). These geographic and climatic limitations highlight the need for decentralized veterinary services, improved infrastructure, and digital solutions to strengthen animal healthcare delivery in the underserved regions of these states.

### 2.2 Data Collection and Profiling

Surgical case records from government-owned and registered veterinary clinics were the sources of data for this study. The study covered a nine-year period from January 2015 to September 2024. Surgical cases were profiled and categorized into cosmetic, reproductive, gastrointestinal, musculoskeletal, and ear, nose, and

throat (ENT) surgeries. Cases were classified by year (2015–2024), month (January–December), quarter (Q1: Jan–Mar, Q2: Apr–Jun, Q3: Jul–Sep, Q4: Oct–Dec), species (canine, bovine, caprine, porcine, equine, feline, primate, and ovine), sex (male, female), and age (young, adult). The percentage frequency of each category was calculated.

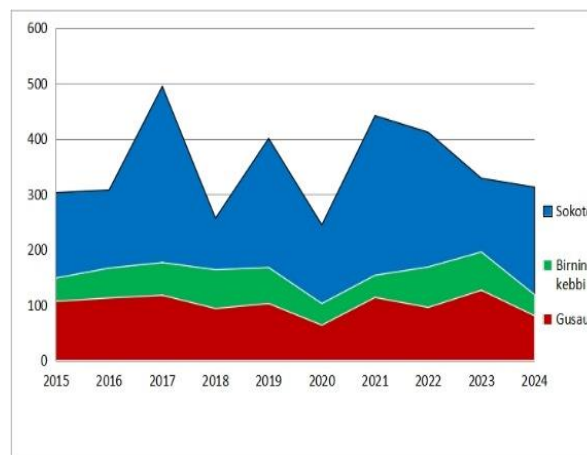
### 2.3 Data Analysis

The data obtained were analyzed using descriptive statistics and presented as percentages in tables and graphical formats

## 3.0 RESULTS

A total of 6,088 cases presented for surgical interventions recorded were reviewed from the veterinary hospital/clinics during the study period (2015–2024). These 6088 surgical cases comprised of 3505 (57.57%) from Sokoto, 1566 (25.72%) from Birnin-Kebbi and 1017 (16.70%) from Gusau.

The yearly surgical burden varied significantly: Sokoto peaked in 2017, while Birnin-Kebbi and Gusau recorded their highest caseloads in 2023. The year 2020 recorded the lowest number of cases in all three cities (Figure 1).



**Figure 1. Yearly Distribution of Surgical Case Loads Across Three Cities in North-western Nigeria (2015–2024)**

The first quarter of the year generally recorded a higher surgical case load, while the second quarter had the lowest burden (Figure 2). The monthly profile indicates a high surgical burden in January and February, with May having the lowest number of surgical cases presented during the study period (Figure 3).

The results of the surgical categories, as shown in Table 1, reveal that musculoskeletal surgeries were predominant (67.08%), followed by reproductive

surgeries (26.28%), while ear, nose, and throat (ENT) surgeries had the lowest prevalence (1.12%).

The species profile (Table 2) showed ovine species as the most frequently presented, with no surgical case recorded for porcine species in any of the three cities. More females (46.16%) than males (41.84%) were presented for surgery, while about 12% of the cases had no sex recorded (Table 3). A greater proportion of the animals presented for surgery were adults (55.29%) more than one year old (Table 4).

Records of surgical protocols indicate that pre-anaesthetic assessments were not recorded in 98.28% of the cases, while only 1.72% had recorded assessments (Table 5). Of the anaesthetic protocols, 93.63% were not recorded and only 6.37% were documented. Post-operative care was recorded in 93.18% of the cases, while it was not recorded in 6.82%.

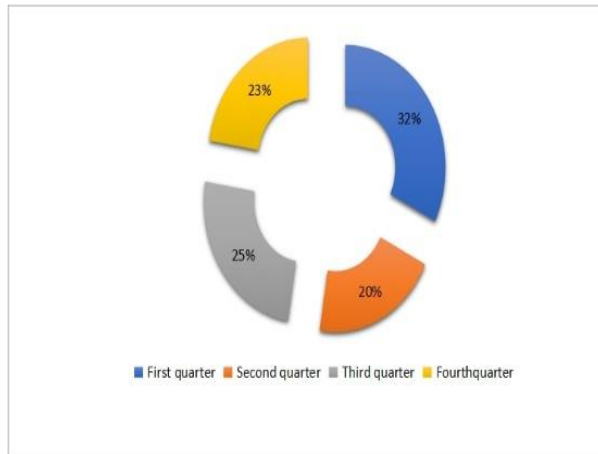


Figure 2. Quarterly Distribution of Surgical Case Loads in Three Cities of North-Western Nigeria (2015-2024).

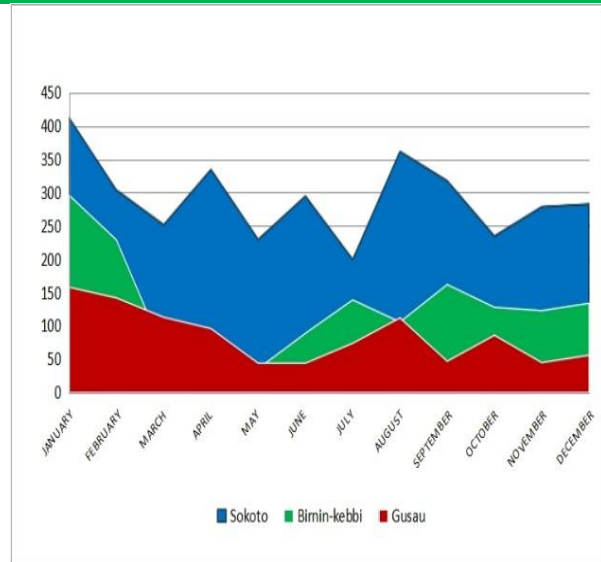


Figure 3. Monthly Distribution Of Surgical Case Loads across Three Cities of North-Western Nigeria (2015-2024).

Table 1. Prevalence of Surgical Case Categories in Three Cities of North-Western Nigeria (2015-2024)

Surgical categories	Total number	Prevalence (%)
Musculoskeletal	4084	67.08
Reproductive	1600	26.28
Gastrointestinal	185	3.04
Cosmetic	151	2.48
Ear, Nose and Throat (ENT)	68	1.12
<b>Total</b>	<b>6088</b>	<b>100.0</b>

Table 2. Species Prevalence of Animals Presented for Surgery in Three Cities of North-Western Nigeria (2015-2024)

Specie	Total number	Prevalence (%)
Ovine	2259	37.11
Caprine	1534	25.20
Canine	1209	19.86
Feline	791	12.99
Bovine	199	3.27
Equine	66	1.08
Porcine	0	0.00
Primate	30	0.49
<b>Total</b>	<b>5929</b>	<b>100</b>

Table 3: Sex Profile of Animals Presented for Surgery in Three Cities of North-Western Nigeria (2015-2024)

Sex	Total number	Prevalence (%)
Male	2547	41.84
Female	2810	46.16
Not recorded	731	12.00
<b>Total</b>	<b>6088</b>	<b>100</b>

**Table 4 Age Profile of Animals Presented for Surgery in Three Cities of North-Western Nigeria (2015-2024)**

Age	Total number	Prevalence (%)
Adult	3366	55.29
Young	1020	16.75
Nil	1702	27.96

**Table 5: Percentage Of Record Keeping Profile for Surgical Cases in Three Cities of North-Western Nigeria (2015-2024)**

Surgical protocol record	Pre-anaesthetic assessment (%)	Anaesthetic protocol (%)	Post-operative care (%)
Recorded	1.72	6.37	93.18
Not recorded	98.28	93.63	6.82

#### 4.0 DISCUSSION

This nine-year retrospective study highlighted high incidence of veterinary surgical cases in Sokoto (57.57%), followed by Birnin-Kebbi (25.72%) and Gusau (16.70%). This distribution suggests a potential disparity in access to veterinary surgical services across these cities in the North-Western region which may be influenced by factors such as population density, economic status, and the availability of veterinary professionals.

The higher surgical case load observed in the first quarter of the year, with January and February showing particularly high burdens, contrasts with findings from Unamba-Oparah et al. (2018) in South-Eastern Nigeria. However, the pattern identified in this study may be associated with the post-harvest period in the region, during which many animals are purchased by farmers for fattening ahead of the Eid-El-Kabir festival (Umaru et al., 2009).

The low surgical case load in the second quarter, particularly in May, may be due to the dry season. Shortage of animal feeds, coupled with the cost of surgery, may discourage owners from presenting animals for surgical procedures, often opting instead for slaughter. A study by Olusiyi et al. (2021) similarly observed an increased number of animals being slaughtered during the dry season, attributing this trend to the substantial threat the season poses to livestock due to feed scarcity and adverse environmental conditions.

The year 2020 recorded the lowest number of surgical cases in all the three states, which may be due to the national lockdown implemented in response to the COVID-19 pandemic. This fluctuation reflects broader

trends in animal health issues and changes in veterinary practice patterns during this challenging period.

The high prevalence of musculoskeletal surgeries obtained in this study for the three cities largely resulted from traumatic injuries such as wounds from booting and fractures due to road traffic accidents, which are common in domestic animals, this may be due to their presence in urban area where they are more exposed to automobile accidents. This finding aligns with the reports by Unamba-Oparah *et al.*, (2018) in South-eastern Nigeria and Eyarefe and Dei (2014) in Ghana. However, unlike those studies where canines were more frequently presented, this study found a higher number of ovine species undergoing musculoskeletal surgery, consistent with findings by Suleiman et al. (2023) and Singh et al. (2020).

The high prevalence of surgical cases in ovine species may be attributed to their anatomical predisposition to certain conditions, such as urolithiasis (especially in males fed on high-concentrate diets) and entropion, which is common in lambs (Lewis et al. 2023). These conditions are less frequently reported in goats or cattle. Additionally, sheep are often raised under intensive management systems, increasing the incidence of traumatic injuries, dystocia, rectal prolapse (Scott & Sargion, 2021). Inappropriate genetic selection for production traits may also contribute to congenital or acquired conditions requiring surgical correction (Scott & Sargison, 2021). Moreover, breeding rams often hold greater economic or cultural value compared to goats, justifying investment in surgical treatment (FAO, 2022). Reporting and treatment biases may also influence case prevalence, as owners may be more attuned to abnormalities in sheep and more inclined to seek treatment than they are for goats or cattle (Da Silva et al., 2024).

Feline species had a notably high surgical presentation, possibly reflecting the growing acceptance of cats as companion animals in the region. This finding contrasts with those of Eyarefe et al. (2020) and Unamba-Oparah et al. (2018), suggesting cultural and belief-based differences in pet ownership between regions.

The low number of equine and bovine surgeries could be attributed to several factors, including the high cost of transporting large animals to veterinary clinics (Adedokun et al., 2023), poor record-keeping of ambulatory herd and stable visits, and widespread practices of quackery and self-medication among livestock owners. Notably, there were no recorded cases for porcine species, may be due to the predominantly

Muslim population in the three cities (Garba et al., 2021).

The higher prevalence of female animals presented for surgery may be due to their primary role in reproduction. Their bone mineral content is more extensively utilized, especially during pregnancy, predisposing them to fractures. Additionally, reproductive complications such as dystocia necessitating cesarean sections contribute to their surgical burden. These findings corroborate with those of Abdulrahman et al. (2020), although they differ from Unamba-Oparah et al. (2018), who reported a higher incidence of surgeries in males due to their active behavior leading to trauma and injuries.

The predominance of adult animals over young ones in the surgical cases presented suggests that owners prioritize surgical interventions for mature animals, possibly due to their higher economic value or established bonds with owners.

Data on animal population that access a veterinary medical facility are vital tools for local, national, or global health strategic planning (King *et al.*, 2020; Hripcsak *et al.*, 2023). The findings of this study revealed poor record keeping system, this study therefore suggest the need to employ electronic medical records, standardized protocols, and staff training to improve documentation practices in veterinary hospital/clinics across the three cities of the region.

## 5.0 CONCLUSION

The results of this study give a vivid distribution and characteristics of veterinary surgical cases profile in Sokoto, Kebbi and Zamfara states of North-western Nigeria, uncovering notable patterns in seasonal caseloads, affected species, and surgical categories. A significant predominance of musculoskeletal surgeries in ovine species underscores the region's socio-economic and cultural dependence on sheep. Despite the volume and importance of these surgical interventions, the study reveals critical gaps in documentation, particularly concerning pre-anaesthetic and anaesthetic protocols. These deficiencies pose significant challenges to veterinary healthcare quality, evidence-based research, and effective health planning. This study recommends the adoption of electronic medical records, standardized documentation protocols, and targeted staff training to enhance data accuracy and improve clinical outcomes. Investment in mobile veterinary units, expanded clinic infrastructure, and stronger government engagement are also necessary. Regular surgical audits, data sharing, and specialized training in surgical

techniques particularly orthopaedics surgery will further strengthen veterinary healthcare delivery in the region.

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