

## **MORTALITY PATTERN IN ZOO ANIMALS IN SOUTH –WEST, NIGERIA**

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### **ABSTRACT**

A retrospective study was conducted to determine the mortality pattern and causes in wild captive and zoological garden animals kept at University of Ibadan zoological garden, South-West Nigeria. A total of Sixty-six (66) cases were recorded from the Department of Veterinary Pathology, University of Ibadan Veterinary Teaching Hospital, Ibadan. Between 2010 and 2015 about 66 carcasses of zoo animals were presented for post-mortem comprising highest number of deaths in mammals (62.1%) followed by birds (21.2%) and the least in reptiles (16.7%). The mortality pattern and rate revealed that highest mortality was among adult animals (81.8 %) and lowest was in the young ones (4.5%).

**KEY WORD:** Animals, Mortality pattern, Zoo, Nigeria.

## INTRODUCTION.

Zoological gardens exhibit wild animals for aesthetic, educational and conservation purposes(Ladd, 2009.). Zoological gardens also provide an opportunity for the conservation of the endangered or threatened species and possible breeding from captivity to repopulate the natural environment. Zoos also provide opportunities for studying the best practices in conservation, animal management and genetic resource of the threatened populations (Zhao et al., 2014; Adeniyi et al 2015).Reports of high mortalities in zoos and free living wild animals have often causes serious concern among conservationists since zoos are meant to play a major role in their conservation (Russel, 2006).

Zoological gardens serve as a link between the wild and the public and report according to Geoff (2007) revealed that 75% of global emerging human diseases have a wild animal link. Captive exotic animal-linked zoonosis has been considered as part of a major global emerging disease problem. It has been reported that when large number and wide variety of species of wild animals are held in close-confinement, it results in stress for the animals. This increases their susceptibility to pathogens. Also, these diseases may have been exacerbated in the captive animals because of the restrictions. Emotional, psychological and mental (behavioural) diseases occur in zoo animals more than their counterparts in parks or in the wild (Johansen et al, 2011).

The mortalities of many wild animals at the University of Ibadan zoological gardens between 1969 and 2006 were due to parasitic diseases, pneumonia, gastroenteritis, neoplastic conditions, malnutrition, injuries and poisoning (Anga and Akpavie, 2002; Emikpe et al 2002; Emikpe et al 2007). Report by Emikpe et al, (2016) revealed pathological conditions, pattern of zoo and wildlife diseases in our environment: pasteurellosis and other forms of respiratory diseases were common in ruminants; pneumonia, trichuriasis and endocarditis were common in primates; tuberculosis and helminthiasis (ancylostomiasis) were common in carnivores; enteritis and impaction were common in reptiles; cholera, salmonellosis and Newcastle diseases were common in aviary.

Emergence of key zoonotic and production-animal diseases derived from and within wildlife populations has increased awareness worldwide of the importance of zoological medicine and study of their diseases in protecting both livestock and public health (Embrey et al, 2012).

This study was conducted to determine the pattern of mortalities in captive wild animals in the zoological garden of University of Ibadan, Ibadan between 2010 and 2015. The knowledge of mortality pattern and diseases will help prevent further economic loss due to death of animals in the zoo by putting in place appropriate preventive measures.

## MATERIALS AND METHODS

### **The Study Area**

The study was conducted in Ibadan (lat. 7.3907N and longitude 3.89 23E), the capital of Oyo State in Nigeria. A retrospective survey was carried out on mortality pattern and diseases causing death in captive and Zoological Garden animals on necropsy records from 2010-2015. The animal distribution, class and age were obtained from the post mortem record. The gross pathological diagnosis was made based on history, clinical signs shown before death, and macroscopic lesions observed during post mortem. Confirmatory diagnosis of some samples was based on histopathology. The ensuing data were analysed descriptively and presented using tables and proportions (in percentage).

## RESULTS

The post-mortem records showed that 66 wild/zoo animal cases were diagnosed between the 2010 and 2015. Of the sixty-six (66) cases recorded, mammals were 41(62.1 %), reptiles 11 (16.7%), aviary 14 (21.2%). The highest cases of mortality was recorded in monkeys (18.1%), followed by Lions (12.1%). The year 2012, was the year with highest record of death of animals with 23 deaths. Highest numbers was among adult animals and least among young animals.

Table 1. Animal Distribution, Number of Mortalities and Percentage.

S/N	ANIMAL	NUMBER	PERCENTAGE (%)
1	Lion	8	12.1
2	Hyena	2	3.0
3	Mongoose	1	1.5
4	Tortoise	4	6.0
5	Gazelle	3	4.5
6	Crocodile	4	6.0
7	Monitor lizard	1	1.5
8	Jackal	1	1.5
9	Fox	3	4.5
10	Horse	2	3.0
11	Ostrich	4	6.0
12	Stork bird	3	4.5
13	Camel	2	3.0
14	Donkey	2	3.0
15	Purple swamp hen	1	1.5
16	Duck	2	3.0
17	Goose	1	1.5
18	Eagle	1	1.5
19	Baboon	2	3.0
20	Spurred turtles	1	1.5
21	Emu	2	3.0
22	Monkey	12	18.1
23	Red river hog	1	1.5
24	Royal python	1	1.5
25	Lizard buzzard	1	1.5
26	Chimpanzee	1	1.5
	Total	66	100

Table2. Class Distribution of Animals

CLASS OF ANIMAL	NUMBER	PERCENTAGE (%)
Mammals	41	62.1
Reptiles	11	16.7
Birds	14	21.2
Total	66	100

The highest cases of mortality were in mammals and the least was in reptiles.

Table 3. The Numbers of Mortalities Recorded per Year.

S/N	YEAR	NO OF MORTALITY	PERCENTAGE (%)
1	2010	3	4.5
2	2011	9	13.6
3	2012	23	34.8
4	2013	14	21.2
5	2014	13	19.6
6	2015	4	6.1

The year 2012 has the highest record of deaths.

Table4. Age Distribution of Presented Cases

AGE	TOTAL	PERCENTAGE (%)
Adult	54	81.8
Young	3	4.5
Unspecified	9	13.6 s

## DISCUSSION

The mortality pattern and rate in this study could be due population of different animal species available in the zoo. The highest mortality was among adult animals (81.8 %) and lowest was in the young ones (4.5%). This is in agreement with report by Asquith *et al.*, (2012) which revealed that old animals are often susceptible to diseases possibly due to age- related decline in immune- function known as immune senescence, changes in the adaptive immune system and the innate immune system (Asquith *et al.*,2012). Also, death rate is observed occasionally in the young animals due to stress of early weaning or absence of maternal immunity. The highest number of deaths was observed in the year 2012. The reason for this was as a result of flooding which occurred on August 26th 2011, a tragic flood in Ibadan which took human lives and damaged public and private properties also affected the zoo. This accounted for increased mortalities in 2012, as was also observed in Halle (Gertler *et al.*, 2015). International Institute of Tropical Agriculture automatic rainfall gauge recorded an all-time high of 187.5 mm rainfall for August 26th. Some animals drowned by flood could not be presented for postmortem. Adetunji and Adesope also highlighted influence of seasonal variation on mortality rate and pattern in the zoo. Annual increase in mortalities was reported and majority of the deaths occurred during the rainy season.

To achieve significant reduction in mortalities in wild animals in zoological gardens should be properly housed, fed and appropriate biosecurity measures should be adopted.

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