

## Original Research Article

## Descriptive epidemiology of monkeypox outbreak in Akwa Ibom State, Nigeria – 5th October to 7th November 2017

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**Abstract:** Monkeypox is an infection with the monkeypox virus through either animal-to-human or human-to-human transmission. On the 24<sup>th</sup> of September, 2017, the Nigerian Centre for Disease Control (NCDC) was notified of a suspected outbreak of monkeypox in Akwa Ibom State. Residents of the Nigerian Field Epidemiology and Laboratory Training Programme (NFELTP) were sent to investigate the outbreak and propose recommendations. We defined a case of monkeypox as any person presenting with a history of sudden onset of fever, followed by a vesiculo-pustular rash occurring mostly on the face, palms and soles of feet. We reviewed case notes and case identification forms, we interviewed the cases and their contacts and engaged in active case search in the affected communities. We sent 10 specimens of swabs of skin lesions and blood for laboratory testing and described the outbreak by time, place and person. A total of 15 cases occurred in the state. Eight (53.3%) were males. The attack rate was 2 per 100,000 populations and the case fatality rate (CFR) was 0%. Eleven (73.3%) of the cases were reported in Uyo, the State capital. Six (20.0%) of the 10 samples sent to the laboratory were positive for monkeypox. We concluded that there was a monkeypox outbreak in the State. We recommended that surveillance for new cases should be intensified; logistics for sample transportation and contact tracing should be made available; and social mobilization should be intensified to reach out to schools, churches and other public places so as to increase the public's awareness to monkeypox.

**Keywords:** Monkeypox, Fever, Disease Outbreaks, Exanthema.

### INTRODUCTION

Monkeypox is a disease caused by infection with the monkeypox virus, which belongs to the *Orthopoxvirus* genus in the family *Poxviridae*. The natural reservoir of monkeypox remains unknown. However, African rodent species are expected to play a role in transmission. There is animal-to-human transmission from various wildlife as well as secondary spread through human-to-human transmission (World Health Organisation, 2018). The case fatality in monkeypox outbreaks has been between 0% and 10%, with most deaths occurring in younger age groups. There is no effective treatment or vaccine available. Prevention of infection involves good hand hygiene after contact with infected animals or humans; avoiding contact with animals or any other materials that has been in contact with a sick animal; isolating infected patients from others who could be at risk for infection

and using personal protective equipment when caring for patients (Centers for Disease Control and Prevention, 2015).

Monkeypox disease was first recorded in Nigeria in 1972 when 2 cases were recorded. Then in 1978 another outbreak occurred with a single case recorded (World Health Organisation, 2018). The current outbreak started in Bayelsa State of Nigeria on the 22<sup>nd</sup> of September, 2017. The Nigerian Centre for Diseases Control (NCDC) was notified on the 24<sup>th</sup> of September, 2017. We were deployed by the NCDC to support the response in Akwa Ibom State on the 5<sup>th</sup> of October 2017. The objective of this investigation was to determine if this was a monkeypox outbreak and to propose control measures.

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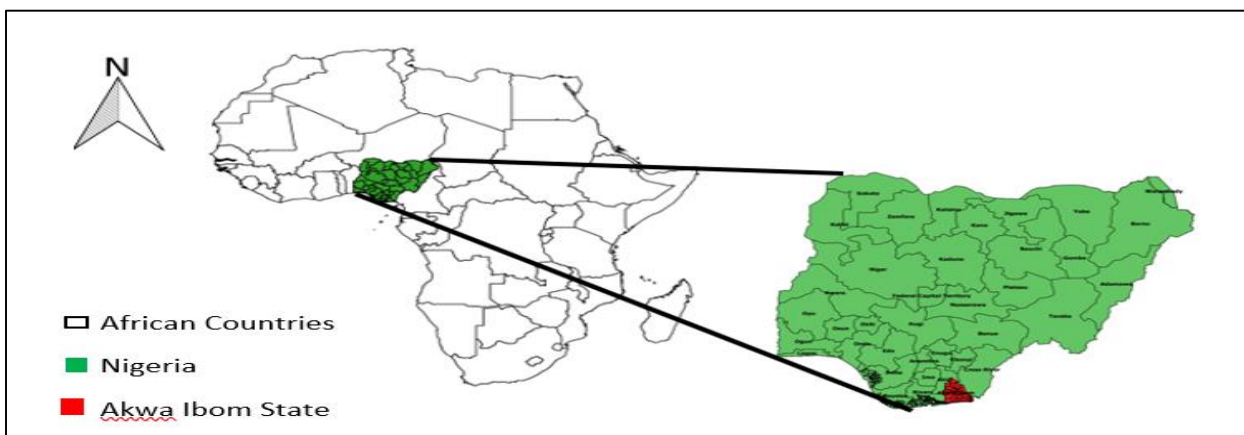
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**MATERIALS AND METHODS**

**Study Area**

Akwa Ibom State is one of the 36 States in Nigeria. It lies between latitudes 4°32'N and 5°33'N, and longitudes 7°25'E and 8°25'E. It is bounded on the South by the Gulf of Guinea. The State currently covers a total land area of 7,249 square kilometers and about 13.4 percent of the 960km of Nigeria’s Atlantic Ocean coastline runs through the State. The State also three distinct vegetation zones: the saline water swamp forest,

the fresh water swamp forest and the rain forest. Akwa Ibom State has a tropical climate marked by two distinct seasons: the dry season (November – March) and the Wet season (April – October). The average temperature of the State ranges from 23 to 31 degrees centigrade. With the annual growth rate of the population projected at 3.4%, the 2016 projected population is estimated at 5,451,277(Government of Akwa Ibom State, 2019).



**Figure 1: Akwa Ibom State, Nigeria**

**Study Design**

This was an outbreak investigation carried out as a cross sectional study. Cases were defined as **any** person presenting with a history of sudden onset of fever, followed by a vesiculo-pustular rash occurring mostly on the face, palms and soles of feet during the period under investigation.

**Data Collection**

On arrival in the State, we visited the isolation facility where suspected cases were admitted. Five had been discharged and 10 were still on admission. We reviewed the clinical notes and case identification forms and also examined the patients to determine if they met the case definition. We interviewed the patients for exposure factors and history of contacts. In the neighborhood where suspected cases lived, we carried out active case search and investigated possible exposure factors using pictures and questionnaires. Swabs of skin lesions and blood were collected from 10 out of the 15 cases and sent to World Health Organization’s regional reference laboratory in Senegal

for diagnosis. Samples were not collected from 5 suspected cases due to logistics difficulties.

**Data Analysis**

Data was entered into Microsoft Excel and Epi info version 7.2. the data was analysed for frequencies and proportions.

**RESULTS AND DISCUSSION**

A total of 15 cases were identified among whom 8 (53%) were males. The median age was 33 years with a range of 2-47 years. The 20-39 years age group constituted 53% of all cases. The age and sex distribution of the cases are shown in table 1. The cases were clustered around Uyo, the capital of the State as shown in figure 2. The overall attack rate was 2/100,000 and the case fatality rate was 0%. Contact with a sick person was reported as the exposure variable in 70% of the cases (figure 3) and the epidemic curve showed a continuous common source pattern (figure 4). Samples from 6 (60%) of the 10 cases tested positive for Monkeypox virus.

**Table 1 Age and sex distribution of Monkeypox cases in Akwa Ibom State, 5<sup>th</sup> October – 2<sup>nd</sup> November 2017**

Age group (years)	Females Frequency (%)	Males Frequency (%)	TOTAL (%)
0-4	1 (14.3)	0 (0.0)	1 (6.7)
5-9	1(14.3)	0 (0.0)	1 (6.7)
10-19	2 (28.6)	1 (12.5)	3 (20.0)
20-39	2 (28.6)	6 (75.0)	8 (53.3)
40-59	1 (14.3)	1 (12.5)	2 (13.3)
<b>TOTAL</b>	<b>7 *(46.7)</b>	<b>8** (53.3)</b>	<b>15 (100.0)</b>

\*=% of cases that are females, \*\*=% of cases that are males

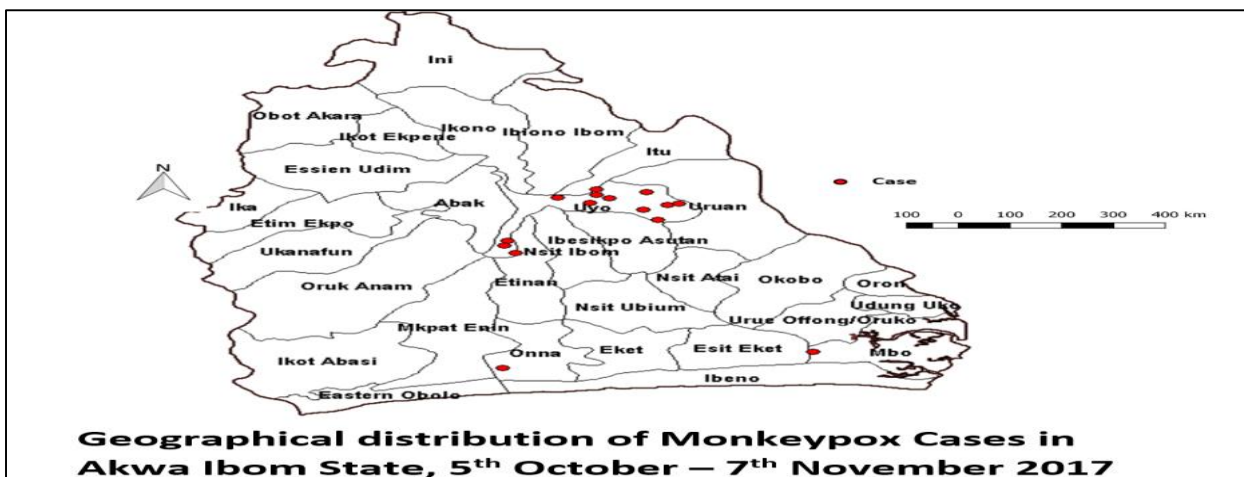


Figure 2. Geographical distribution of monkeypox cases in Akwa Ibom State, Nigeria, 5<sup>th</sup> October - 7<sup>th</sup> November, 2017.

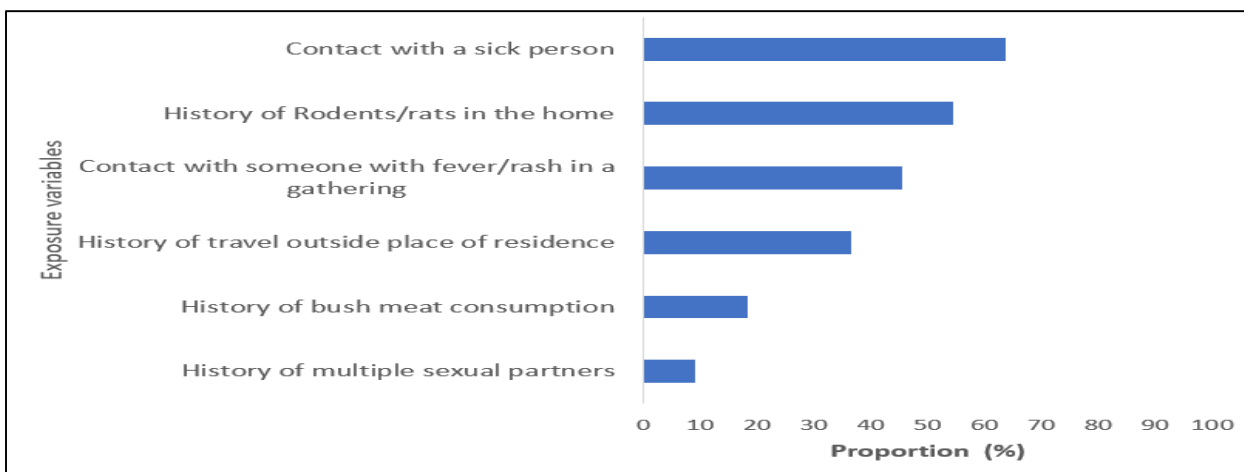


Figure 3: Distribution of exposure variables among Monkeypox cases in Akwa Ibom State, 5<sup>th</sup> October – 7<sup>th</sup> November 2017

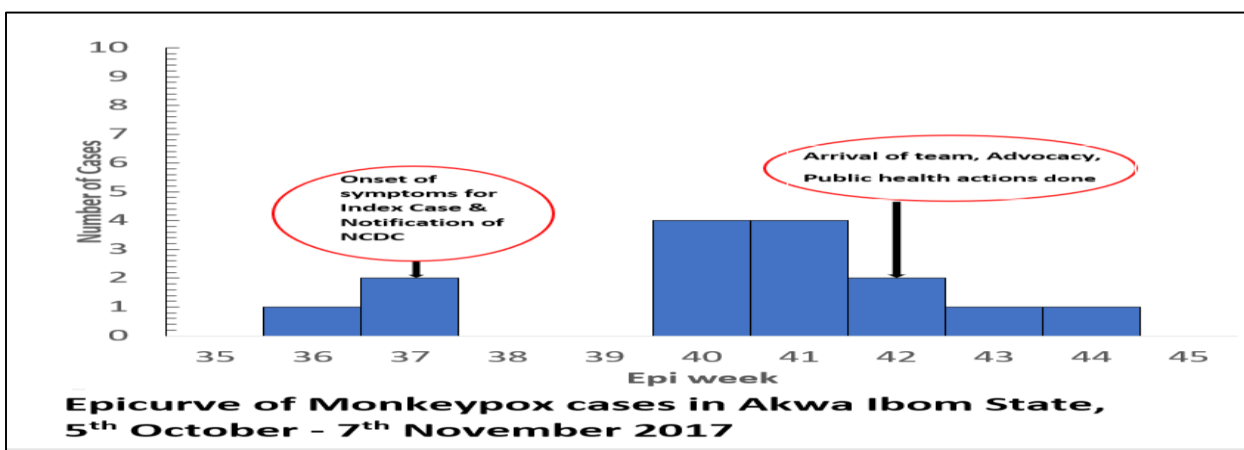


Figure 4: Epidemic curve of monkeypox cases in Akwa Ibom State, 5<sup>th</sup> October – 7<sup>th</sup> November 2017

Outbreaks of monkeypox are rare in Nigeria. This is the first reported outbreak in Akwa Ibom State of Nigeria. The geography of the area is in keeping with other areas in Africa with similar outbreaks(Pal, Mengstie, & Kandi, 2017). The most affected age was 20 to 39 years. This is in contrast to epidemics described in other parts of African where the most

affected groups were younger than 15 years(Pal et al., 2017). Samples from 10 out of the 15 cases were taken for diagnosis. This was due to inadequate supply of personal protective equipments, sample collection materials and materials for packaging and transport. Six out of the 10 samples were positive for monkeypox virus. All the patients had fever and skin lesions that

were consistent with monkeypox infection as has been described in literature (Davis & Stöppler, 2016). Enlarged lymph nodes is considered the most reliable sign differentiating monkeypox from smallpox and chickenpox (Graham & James, 2019). In this outbreak, it was not possible to make this differentiation since the samples were not tested for chickenpox and smallpox.

### CONCLUSION

In conclusion, an outbreak of monkeypox was confirmed in Akwa Ibom State between the 5<sup>th</sup> of September to 7<sup>th</sup> November 2017. We recommended that surveillance for new cases should be intensified, logistics for sample transportation and contact tracing should be made available and enlightenment campaigns should be intensified to increase the public's awareness of monkeypox.

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