

## Effects of Vaccination on the Prevalence of Peste Des Petits Ruminants (PPR) in Small Ruminants in Taraba State, Nigeria

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### ABSTRAK

Satu kajian telah dijalankan untuk menentukan taburan Peste Des Petits Ruminants (PPR) dan usaha pemvaksinan di Negeri Taraba, Nigeria menggunakan data yang dikumpulkan daripada Jabatan Perkhidmatan Veterinar di Kementerian Pertanian dan Pembangunan Luar Bandar Negeri antara tahun 1992 dan 1998. Keputusan menunjukkan bahawa penyakit tersebut adalah paling tersebar luas semasa bulan-bulan yang sejuk pada tahun tersebut (Hamattan) dan permulaan musim hujan. Begitu juga, tercetusnya penyakit tersebut yang meningkat kerana pengenduran program kempen pemvaksinan. Diperhatikan bahawa jumlah tercetusnya penyakit tersebut adalah rendah apabila pemvaksinan menggunakan Tissue-Culture-Rinderpest Vaccine (TCRV) yang diperkuatkan dan ia meningkat apabila pemvaksinan dikendurkan. Ia boleh disimpulkan daripada kajian ini bahawa kempen pemvaksinan intensif ruminan kecil terhadap PPR melalui peruntukan fasiliti secukupnya, vaksin TCRV, melatih pekerja luar dan kempen kesedaran massa di kampung-kampung adalah paling utama untuk mengawal ancaman penyakit ini di Nigeria.

### ABSTRACT

An investigation was conducted in order to determine the distribution of Peste Des Petits Ruminants (PPR) and vaccination efforts in Taraba State of Nigeria using data collected from the Veterinary Services Department of the State's Ministry of Agriculture and Rural Development between 1992 and 1998. The results showed that the disease is most prevalent during the cold months of the year (Hamattan) and beginning of the rainy season. Similarly, outbreaks increased with the relaxation of vaccination campaign programmes. It was observed that the number of outbreak was low when a vaccination using Tissue-Culture-Rinderpest Vaccine (TCRV) was intensified and it increases when the vaccination was relaxed. It was concluded from this study that intensive vaccination campaign of small ruminants against the PPR through provision of adequate facilities, TCRV vaccines, training of field workers and mass enlightenment campaign in the villages are paramount to control menace of the disease in Nigeria.

### INTRODUCTION

Peste Des Petits ruminants (PPR) is an acute and highly contagious rinderpest – like viral disease of small ruminants, especially sheep and goats. It causes higher morbidity and mortality in goats than in sheep. The disease is characterized by fever, pneumonia, occlusion nasal discharge,

anorexia, necrotizing erosive stomatitis, enteritis and diarrhea (Nawathe and Taylor 1979).

The PPR is caused by a Morbillivirus which has been shown to be similar in ultrastructure to the rinderpest, canine distemper and measles viruses (Gibs *et al.* 1979). The virus has been classified as the 4<sup>th</sup> member of the Morbillivirus

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genus of the paramyxoviridae family (Abdulkadir 1989).

In Nigeria, Whitney *et al.* (1967) described the disease clinically in affected Nigerian goats under the name 'Kata'. Since its recognition in Nigeria, PPR has continued to be a major disease of small ruminants causing sporadic outbreaks among susceptible sheep and goats. During the course of an epidemic, the villages are known to lose their entire populations of small ruminants. In Nigeria, over one hundred outbreaks are reported annually and many more go unreported (Nawathe 1984).

Hamdy *et al.* (1976) considered PPR to be responsible for losses to the tune of \$1.5 million, and by now, with rising inflation, it could well be over \$10.0 million annually. PPR therefore, is an economically significant disease considering the fact that it affects small ruminants, which are found practically in almost every household in Nigeria. These small ruminants are found to contribute significantly to the income of rural dwellers and the protein consumption in the country providing about 46% of the quantity of meat consumed in the country (Emmanuel 1980). This therefore, explains why control of PPR should be intensified by governments or voluntary organizations.

Attempts made so far in the control of the disease in Nigeria is by vaccination using the Tissue-Culture-Rinderpest-Vaccine (TCRV) which has been found to afford solid protection against PPR for over one year (Nawathe 1984).

The aim of the study therefore, was to determine the prevalence of PPR in Taraba State of Nigeria vis-à-vis the control measures using TCRV and make possible recommendations on how to control the disease.

#### MATERIALS AND METHODS

Data were collected from the Veterinary Department of the State's Ministry of Agriculture and Rural Development on PPR outbreaks and vaccination figures in Taraba State for a period of seven years, spanning from 1992 to 1998.

The vaccine used was Tissue-Culture-Rinderpest-Vaccine (TCRV), a heterologous live attenuated viral vaccine prepared from the National Veterinary Research Institute (NVRI), Vom, Plateau State, Nigeria in which half the large ruminant dose was administered to the small ruminants which confers a solid immunity against PPR for at least one year. Therefore, the vaccination exercise was repeated annually.

The prevalence of the disease and specifically the relationships between vaccination campaign and outbreak of PPR in the State were determined.

Similarly, monthly variation for the reported outbreaks was determined using the Ratio-to-Moving average method or Time Series Analysis in which the data was recorded month by month for the entire period of the study i.e from January 1992 to December 1992, then January of the next year, 1993 to December, 1993 to so on up to 1998. A centered average was determined for all and each month, the averages were computed such that the data was represented using 12 months. The data was therefore summarized to be represented by 12 months and extraneous variations were eliminated, such that against each month is the seasonal index for that month. It was the seasonal index that was plotted against the months (x-axis) to obtain a plot that shows seasonal index of the PPR.

#### RESULTS

The result showed that the number of outbreaks increased only from 1993-1995. Thereafter, the outbreak number was on the decline (*Fig. 1*).

An increase in the number of animals vaccinated was also recorded in 1993, 1994 and 1997. The period from 1995 to 1998 was characterized by a fluctuation in the number of animals vaccinated. While the number of animals vaccinated was high in 1995, it was low in 1996 and increased again in 1997 with another decrease in 1998.

The relationship between the vaccination figures and the number of outbreak is shown in *Fig. 1*. When the vaccination campaign was intensified in 1994, the number of outbreaks was low. In 1995, the number of outbreaks increased as the vaccination figures went down. From 1995 to 1997, the outbreak was in continuous decline whereas 1998 witnessed a slight increase in the number of outbreaks.

A summary of monthly outbreaks of PPR from 1992 to 1998 revealed that most of the outbreaks occurred in January, March, April and May (*Fig. 2*). A similar result was observed using the seasonal index (*Fig. 3*).

#### DISCUSSION

Results of vaccination campaigns and the outbreak observed in this study further strengthened the assertion that intensified efforts towards effective

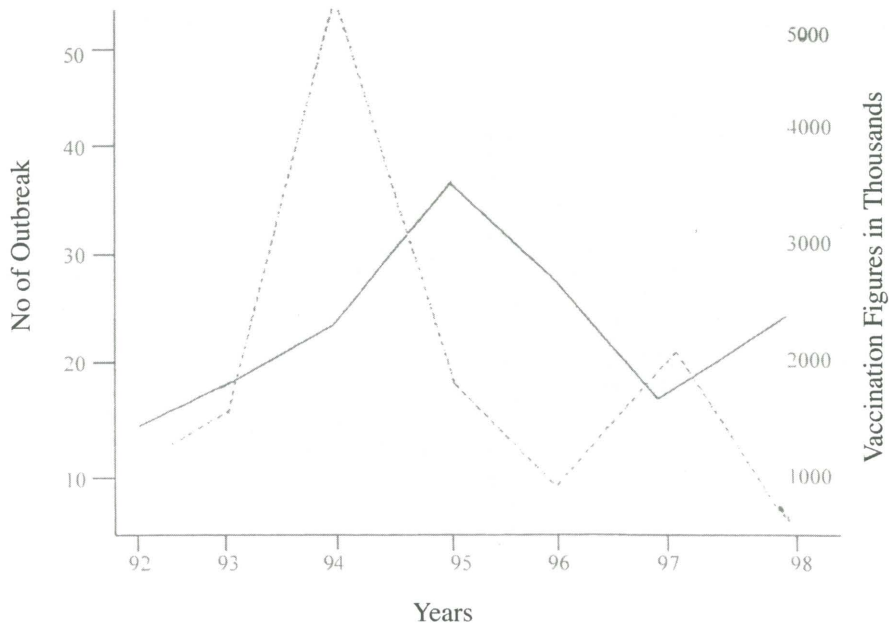


Fig. 1: Relationship between vaccination figures and outbreak of PPR in small ruminants in Taraba State, Nigeria

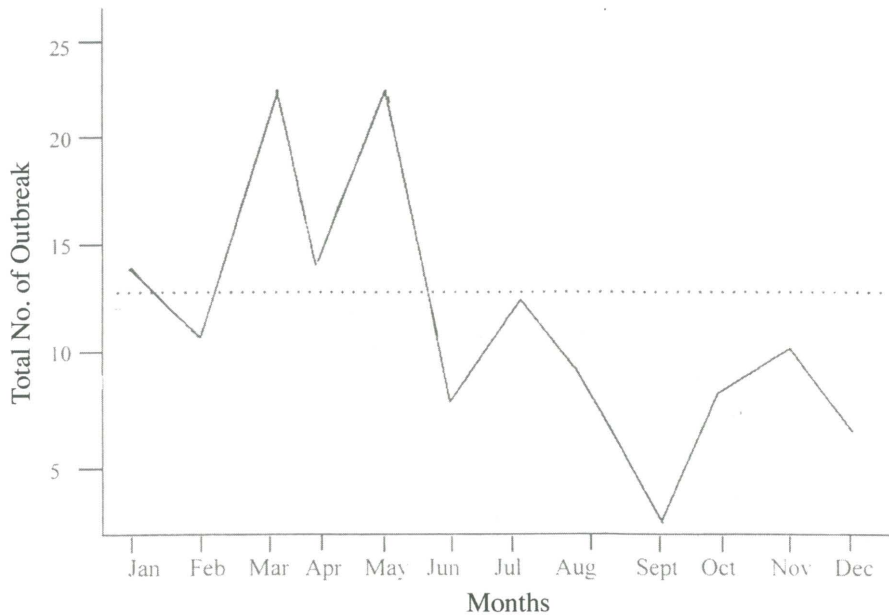


Fig. 2: Monthly distribution of PPR outbreaks in small ruminants in Taraba State of Nigeria (1992-1998)

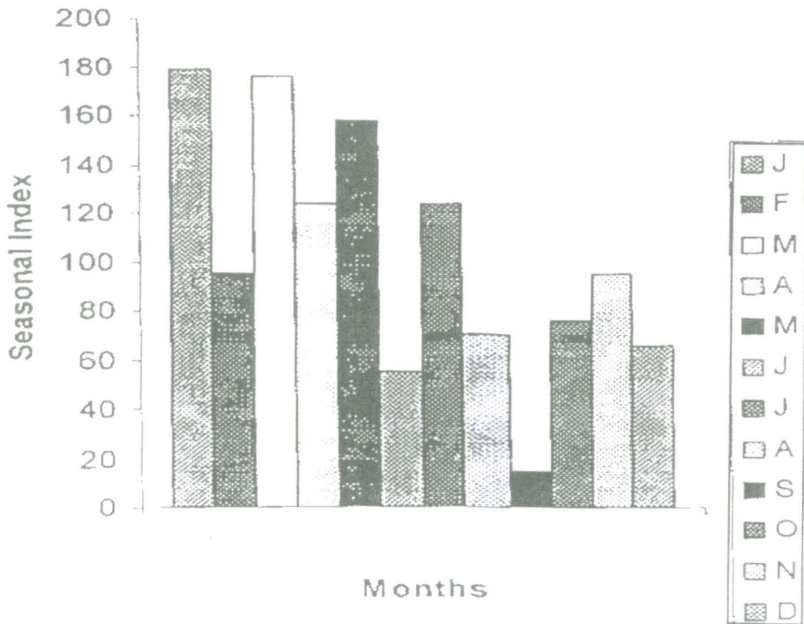


Fig. 3: Seasonal index of PPR in small ruminants in Taraba State of Nigeria from 1992 - 1998

vaccination contributes to lowering PPR outbreaks which tend to agree with reports by Taylor *et al.* (1990) and Majiyabe *et al.* (1994).

A decrease in the number of outbreaks in 1994 (Fig. 1) could have been a result of the launching of vaccination campaigns against PPR in that year which perhaps was effectively carried out due to enthusiasm by both farmers and the vaccination campaign personnel. The subsequent increase in the number of outbreaks in 1995 could have been due to lacity on the part of the government on the vaccination campaign programmes.

The rhythm of vaccination campaigns kept on declining up to 1998; this may have been due to non availability of vaccinate their stocks for fear of adverse post-vaccinal reaction, difficulty in differentiating healthy animals from those incubating the disease and poor record keeping which will not give the actual situation and information on the disease and vaccination campaign programme. Such outbreaks could result in economic losses in Nigeria to the tune of over one million naira (N1,000,000) annually (Lamorde 1980); with the current rise in inflation the losses could even exceed this figure.

It is possible that outbreaks recorded in the State not have reflected the actual situation of

the State as many cases may to unreported. The monthly distribution of PPR outbreak showed that the prevalence of the disease is high during the months of January and March which correspond with the harmattan (dry season) period and months of April and May (pre-rainy season) (Fig. 3). This is in consonance with the report by Obi (1980). These periods in the current study are very critical for the mall ruminants due to scarcity of feed and water. They therefore roam about in search of feed and water and congregate at such few points thereby predisposing them to PPR due to the fast spread of the virus.

It was therefore concluded from this study, that TCRV is effective against PPR and outbreak of the disease may be encountered almost all the year round with the incidence of the disease being higher during the late dry and pre-rainy seasons especially when vaccination exercise is relaxed. Hence it is essential to employ effective and efficient control measures by seeking both national and international co-ordination and commencing the exercise prior to seasonal outbreak as it is evident that the vaccination is dwindling in Nigeria.

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