

# Streptococcus pneumoniae carriage rates among infants in Owerri, Nigeria

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## Abstract

A microbiological survey was carried out on children attending the Paediatric Clinic of the Federal Medical Centre in Owerri, Edo State, Nigeria. The study was carried out to determine the carriage rate of *Streptococcus pneumoniae*, the common cause of acute cold and death among children. Of a total of 71 specimens, *S pneumoniae* was isolated from 49, a prevalence of 69%. Sex distribution showed that females had a higher carriage rate than males (55% vs 45%;  $p=0.05$ ). Children between 12 months and 4 years of age had higher prevalence rates of *S pneumoniae* than children under 12 months and over 4 years.

## Introduction

*Streptococcus pneumoniae* causes a large percentage of acute respiratory and invasive bacterial infections. These infections are most severe among the very young, the elderly, pregnant women, people with defective T-lymphocytes, and those who are immuno-deficient.<sup>1</sup> Illness and deaths from *S pneumoniae* among children in the developed world have been reduced through the use of a nine-valent pneumococcal conjugate vaccine. This vaccine (Prevnar) has been successfully used in South Africa, Gambia, and the Philippines.<sup>2</sup> In Nigeria, there is no licensed vaccine against *S pneumoniae* even though infant deaths occurring due to its co-infection with *Plasmodium* species are on the increase.

## Patients and methods

The children in this study attended the Paediatric Department of the Federal Medical Centre, Owerri for regular check-ups and immunisation. Some showed no symptoms of pneumonic cold, others had cough, chest pain, and chills at intervals. Children that had been given antibiotics were excluded from the study in order to reduce false-negative results. Nasopharyngeal swabs were taken from most of the children (aged 2–59 months) and sent to the bacteriological laboratory within 2–3 hours of collection. The swab sticks were plated on chocolate and blood agar and incubated aerobically for at least 48 hours. Gram-positive cocci that showed haemolysis were characterised as recommended by Duguid et al.<sup>3</sup>

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## Results

Out of seventy-one (71) swab specimens, *S pneumoniae* was isolated from 49, a prevalence of 69%. Using the chi-square test, the sex distribution of *S pneumoniae* among infants between the ages of 2–59 months showed that females had a higher carriage rate than males (55% vs 45%;  $p=0.05$ ). Children between 12 months and 4 years of age had higher prevalence rates of *S pneumoniae* than children under 12 months and over 4 years (see Table 1).

Table 1 Age distribution of *S pneumoniae* among children aged 2–59 months ( $n=49$ )

Age (months)	Frequency of distribution
2–5	1 (2%)
6–11	3 (6%)
12–23	13 (26%)
24–35	14 (29%)
36–47	14 (29%)
48–59	4 (8%)

## Discussion

Similar research in Asia showed carriage rates of *S pneumoniae* of between 49% and 66%. Scientists have suggested that the introduction of a conjugate vaccine could increase herd immunity among children.<sup>4</sup> The current research calls for the collaborated efforts of non-governmental organisations, physicians, and researchers in the fields of microbiology and biotechnology to develop or import an effective vaccine against this bacterial pathogen in Nigeria and other parts of Africa where it is currently unavailable.

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