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MEASLES IN AREAS OF MALNUTRITION

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Measles is a major cause of morbidity and mortality among Nigerian children. In a longitudinal study at Imesi in Western Nigeria, Morley documented 15 measles associated deaths among 222 children with measles, a mortality ratio of 7%. Investigation of individual outbreaks of measles have shown a range of measles associated mortality of 1% to 40%.

The relationship between measles and malnutrition is complex. Many studies have been directed at defining the nutritional changes following measles. Considerably less information is available on the effect of nutrition at the time of infection on the morbidity and mortality of measles. With measles, weight loss is commonly seen. In the Imesi study 24% of children showed a weight loss of 10% or more. In this same study the mean time to recover pre-infection weight was 7.2 weeks. Nutritional studies in children after measles have shown a marked negative nitrogen balance. The practice of restricting protein in children who have measles, a common practice in Nigeria, further accentuates this negative nitrogen balance. The development of Kwashiorkor is commonly seen in the post-measles child. In the Imesi study, 9 of 222 children (4%) developed Kwashiorkor.

MALNUTRITION

As an increased measles mortality has often been associated with severe malnutrition, the great risk of measles to malnourished children in the liberated areas of the Eastern States was realized by the Federal Ministry of Health. In these areas, where agriculture, markets, and community organization had been disrupted by the war, 20-50% of newly liberated children showed clinical signs of malnutrition. In a survey by Foege and Conrad, 1297 new refugees near Ikot Ibritam of the South Eastern State were screened for malnutrition on a height/weight basis. As defined by their criteria, malnutrition rates in different age groups were as shown below.

Table 1: Percent of persons with malnutrition by age group in South East State

Age Group	Percent with Malnutrition
0-4	50
5-14	11
15-44	6
45+	28

Clinical examination of this group revealed an additional 10% of children to be malnourished.

MEASLES

The Eastern States have a definite seasonal pattern of measles occurrence with an increased incidence during the dry season, October to March. Major measles outbreaks have occurred every two years with peaks in 1964 and 1966. (Figure 1)

From the best available information, 1968 was not a major epidemic year and it is postulated that the disruption had decreased the frequency of measles transmission and thus prevented development of the predicted seasonal epidemic. As little measles was seen from July to October in the liberated areas, it is also possible that there

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had been a major interruption in the endemic transmission of measles as well. Thus in October of 1968, a large number of susceptible children, many of whom had malnutrition, were at risk of significant morbidity and mortality from measles. This risk was clearly demonstrated at Ikot Ibritam, where the introduction of measles into a Kwashiorkor treatment centre resulted in a mortality of 50%. Two programmes, a measles immunization campaign, and a surveillance programme were implemented as a co-operative effort of the Federal Government, the State Governments and Voluntary Agencies.

MEASLES CAMPAIGN

Measles/Smallpox teams were organized and trained in each of the 3 Eastern States. In some areas the immunization programme was directed solely at the measles susceptible age group. Children were given measles and smallpox vaccine simultaneously. Because complete coverage could not be achieved before the measles season, the following set of priorities was established.

1. areas reporting measles through the surveillance system
2. areas of refugee concentration (refugee camps, feeding centres)
3. areas with high rates of malnutrition.
4. systematic coverage of the population.

The difficulties of organizing a campaign in areas where the normal channels of communication were completely disrupted cannot be over-emphasized. Reaching the "floating" refugee population was most difficult, and combining it with food distribution was not always successful. Immunization of new refugee populations as they were screened for food distribution cards was more effective. It is estimated that approximately 300,000 children were immunized against measles by March 31 of this year. This represents 60% of the target population in the priority areas. Although follow up was difficult, surveillance of children in an Uyo refugee camp failed to reveal any mortality from the simultaneous immunisation. The only complications noted were multiple primary takes in several children with scabies.

SURVEILLANCE SYSTEM

With the rapid movement in population, changes in local food supply, and threat of epidemic disease, a surveillance system was organized using the relief teams in the field. The system was established to provide weekly information on food distribution. the population receiving food and medical attention, data on communicable disease, (smallpox, measles, meningitis, and pertussis), and death rates. The surveillance system (1) identified areas of measles infection for immediate epidemic control; (2) established the occurrence of significant measles morbidity in children 4-6 years who were being excluded from the target population, (This finding resulted in their inclusion); and (3) monitored the effectiveness of the mass campaign.

RESULTS

Measles vaccine can effectively terminate epidemic measles at the village level. Figure 2 shows the number of reported cases of measles in the village of Ugbowo in the East Central State. This village had a population of 2,500. There were 142 cases with 11 deaths, a fatality rate of 7.7%.

The sharp drop in the epidemic curve following the institution of the immunization programme strongly suggests an effective measles campaign. Data from the Enugu Sector of the East Central State (Figure 3) shows a similar effect. In retrospect, it appears that measles control would have been more effective if initiated 6 weeks earlier.

The case fatality ratios observed in the Enugu sector were 4.9 to 7.7% which is similar to those reported previously from Nigeria. If pre-measles nutritional status is a major determinent of measles mortality, the mortality figures suggest that nutrition

in the Enugu sector was similar to that existing before the war. In a recent visit to the Enugu sector, Dr. Hendriskse observed that nutrition was similar to that in other parts of Nigeria.

The cumulated data on measles cases for the 3 Eastern States are presented in Figure 4- Except for the major outbreak of January 11, when nearly 1,000 cases were reported from the Itu sector of the South Eastern State, major outbreaks have been avoided. The regular reporting of a low number of cases from all of the 26 reporting senters indicates a continuing low level of transmission. This can probably be explained by the less than adequate coverage which, because of the difficulties in health education and communication has averaged an estimated 60 to 80%.

FIGURE 1
MEASLES IN EASTERN NIGERIA – 1964-1966

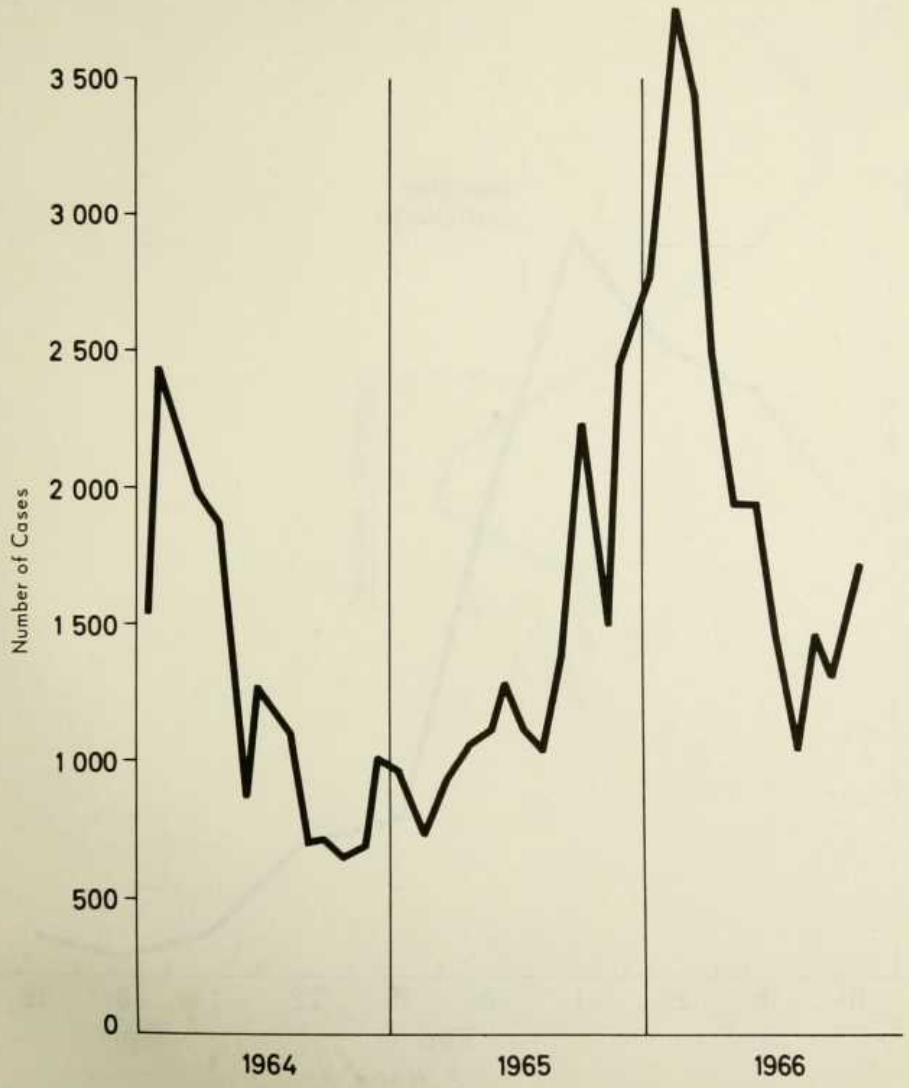

FIGURE 2
EFFECT OF MEASLES VACCINATION CAMPAIGN
ON EPIDEMIC IN UGBOWO VILLAGE

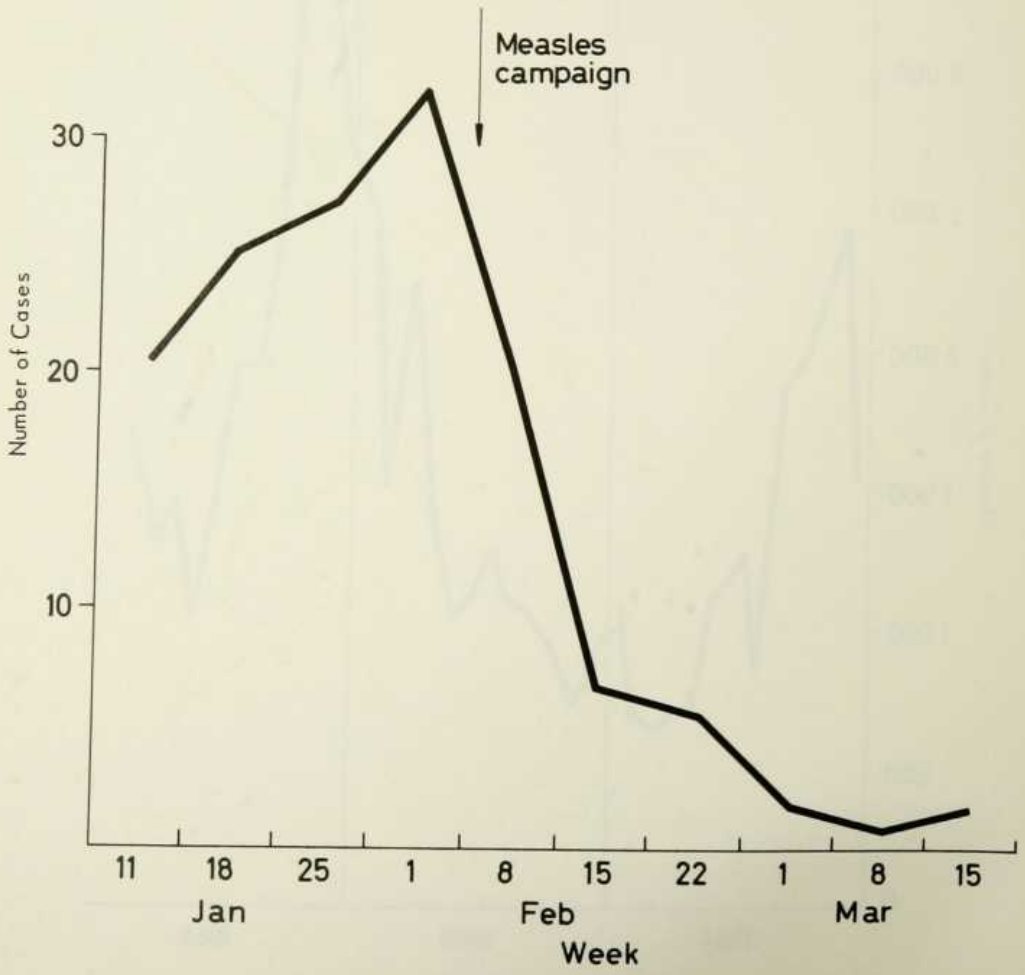

FIGURE 3
EFFECT OF MEASLES VACCINATION CAMPAIGN DURING
AN EPIDEMIC IN ENUGU CENTRAL STATE

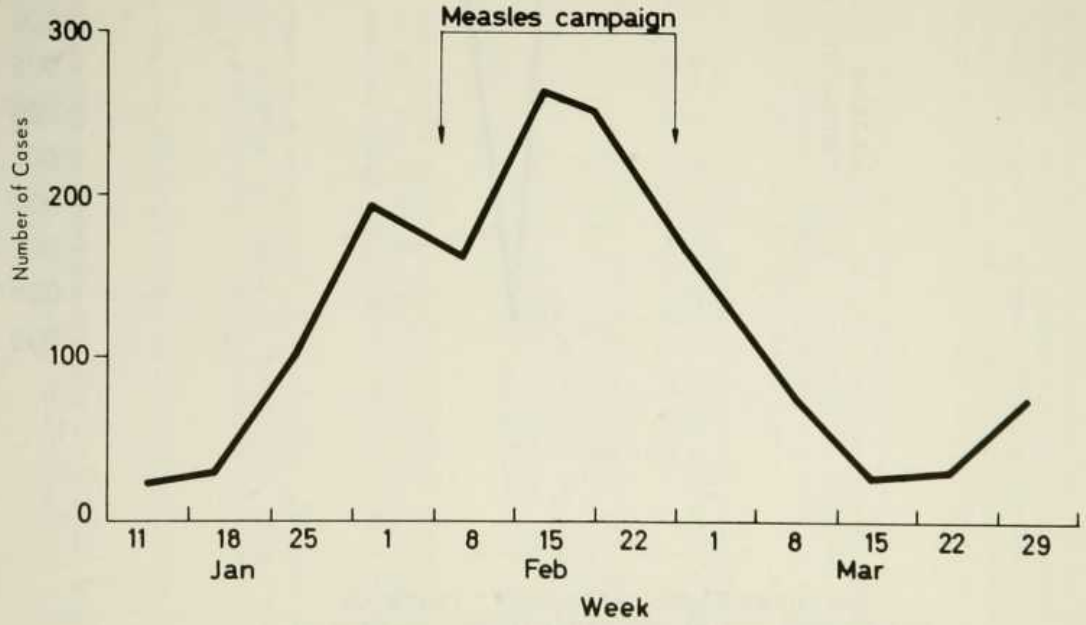

FIGURE 4
NUMBER OF CASES OF MEASLES IN EASTERN STATES
BY WEEKS – NOVEMBER 1968 TO APRIL 1969