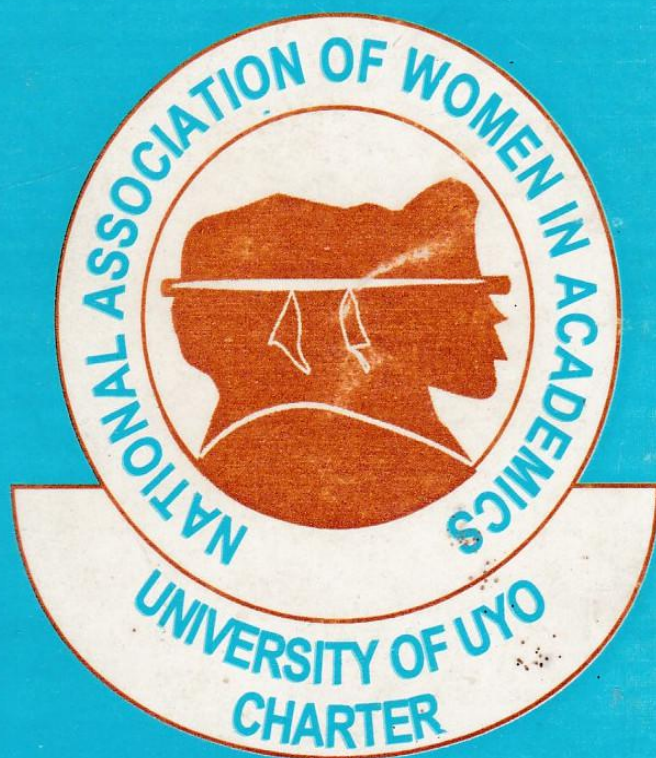


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The Seasonality Of Measles In The Humid Tropical City Of Calabar

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Abstract

Human health and comfort have been influenced by weather and climate. This study on the seasonal variation of measles in the humid tropic was aimed at identifying the character and the predominant season of the diseases. The study was conducted in Calabar, a humid tropical coastal environment. Two main hospitals were chosen in Calabar and data on the disease were collected for a 10-year period (1988 -1997) on a monthly basis. However, the mean monthly averages were used for the analyses. The study shows that there is an annual occurrence of the disease but it, however, exhibits a single peak in the dry months. It was apparent from the analysis that the most important single climatic parameter favouring the occurrence and spread of the disease in the humid tropical environment is temperature.

Introduction

Dating from the earliest human legends, weather has always been popularly associated with health and diseases. (Ayoade, 1983; 1978; Adefolalu, 1984). Human health condition has been influenced by variations in weather and climate. Human responses to these variations in climate have been different, depending on a lot of factors.

Many researchers have shown varying patterns of disease according to varying conditions of weather and climate, (Barton 1977, Adefolalu 1984, Ayoade 1983). However, some diseases have been observed to be prevalent in certain climate zones while others tend to follow a season pattern in their incidence and spread. For instance, Malaria and Yellow Fever are endermic in the tropics as they are transmitted by mosquito species that mostly thrive in the tropics. Similarly, while pneumonia and influenza are noted most during the winter periods in the temperate countries, meningitis is common during the harmattan season in Northern Nigeria (Ayoade 1983, Adefolalu 1984).

Generally, infectious diseases spread more rapidly during the cold season among human population compared to warm season when people engage in more outdoor activities and for a longer period (Baliat and Ananad 1979). Measles is an acute febrile eruption and has been one of the commonest diseases in the tropical environment especially among children (Cherry 1989).

The manifestation of measles infection from the time of exposure to the development of the first symptom is usually nine to eleven days and from exposure to the appearance of rashes is about two weeks (Witty 1974). The initial manifestation of the disease are malaise, irritability, fever with body temperatures as high as 41°C (105°F). Conjunctivitis with excessive lacrimation, edema of the eyelids and photophobia, moderately severe hacking cough and nasal discharge. The prodromal period usually lasts three to four days with a range of one to eight days before the onset of a rash. The red maculopapular rash of measles breaks out first on the forehead, spreads downward over the face, neck and trunk, and appears on the feet on the third day (Witty 1974). This disease was chosen because of the high incidence at particular periods of the year which could be correlated with climatic condition and parameter. The main aim of this study is to examine the seasonal pattern of measles as a disease and identify the climate condition(s) that favour the incidence and spread of the disease. These will be achieved by:

- (1) Determining the season of predominant occurrence of the disease;
- (2) Examine the cycle of occurrence of the disease; and
- (3) Identify the role of each climatic parameter in the incidence and spread of the disease.

From the foregoing, it is clear that this study borders on the temporal variation of measles within the humid tropical environment. This will be useful in the policy formulation; purchase of essential drugs, provisions of enabling condition, materials and environment for treatment and possibly preventive measures taken.

Study Area

This study was done in Calabar the capital city of Cross River State, a humid tropical city. Calabar is located between latitude 4°58' and 5°07'N and longitude 8,201 and 8.251E (Fig. 1). The town is drained by numerous small rivers which meander into the mangrove swamps of the Cross River State estuary. The peninsular of Calabar is moderately undulating with land descending rather abruptly to the Cross River at the Western end of the town while the slope is gradual towards the Kwa River to the east.

The summits of the coastal range or hills rise from the coastal plain sands, about 40 kilometers to the Atlantic sea shore, reaching heights of 60 to 70 meters above sea level in some places. Calabar has a tropical humid type of climate and receives the heaviest amount of rainfall in the country with about eight months of rainfall

within the year (Monau 1975). The dominant wind during the rainy season is the south-west wind and occasionally the equatorial easterly winds. During the dry season, the north-east trade winds bring dust haze associated with the harmattan (Adefolalu 1984). Meteorological records show that in these area there is no month without rainfall on the average. The coastal location of the city has a profound influence on both the temperatures, the relative humidity, wind speed and direction. Relative humidity is generally high throughout the year, however seasonal and diurnal variations are noticeable. Temperatures are generally high, but are often moderated by the cold ocean winds.

Mean annual temperature is about 26°C (79°F). Mean monthly temperatures show a range of 1°C with the peak in February and March and the lowest recorded in August. This is a region of extremes as there are extremes of rainfall, humidity and temperature. (Ofomata 1975).

Materials and Methods

The study was based on records from two hospitals - the General Hospital and University of Calabar Teaching Hospital. Data on the patients who reported to hospital as a result of measles were collected for a ten-year period (1988 -1997) on monthly bases.

Data on climatic parameters were collected from Calabar meteorological station for ten years (1988 -1997). Climatic parameters considered of relevance in the study include rainfall, temperature and relative humidity. These data on the disease were matched with the data on climate. The occurrence of the disease was plotted against the parameter.

This produced a visual impression of the two sets of variables allowing the peak period of the disease to be matched against the available climatic conditions. Person moment correlation was done using the climatic condition as the independent variable and regression was used to test the strength of the association between climatic parameters and the incidence of the disease.

Results and Discussion

Measles as a disease occurs almost everywhere but its occurrence in Calabar shows a marked seasonal pattern. Monthly average values of the disease are shown in Table 1.

TABLE 1: OCCURRENCE OF MEASLES IN CALABAR

| MONTH | J | F | M | A | M | J | J | A | S | O | N | D | TOTAL |
|--------------|------|-------|-------|------|------|------|------|------|------|------|-------|-------|-------|
| NO. OF CASES | 200 | 279 | 221 | 106 | 88 | 100 | 109 | 117 | 132 | 154 | 273 | 201 | 1980 |
| PERCENTAGE | 10.1 | 14.09 | 11.16 | 5.35 | 4.44 | 5.05 | 5.51 | 5.91 | 6.67 | 7.78 | 13.79 | 10.15 | |

SOURCE: Derived from Field Data

Measles shows a clear peak during the dry season though it has an average spread over the year with no month without the occurrence of these diseases. The peak is noted for the month of November through March, which are the peak of the dry season. These dry months are the months when temperature values are highest (Fig. 3). There was a notable drop in the number of occurrence of the disease in December and January. This could be attributed to the significant drop in the temperature values recorded in these months as a result of the harmattan haze.

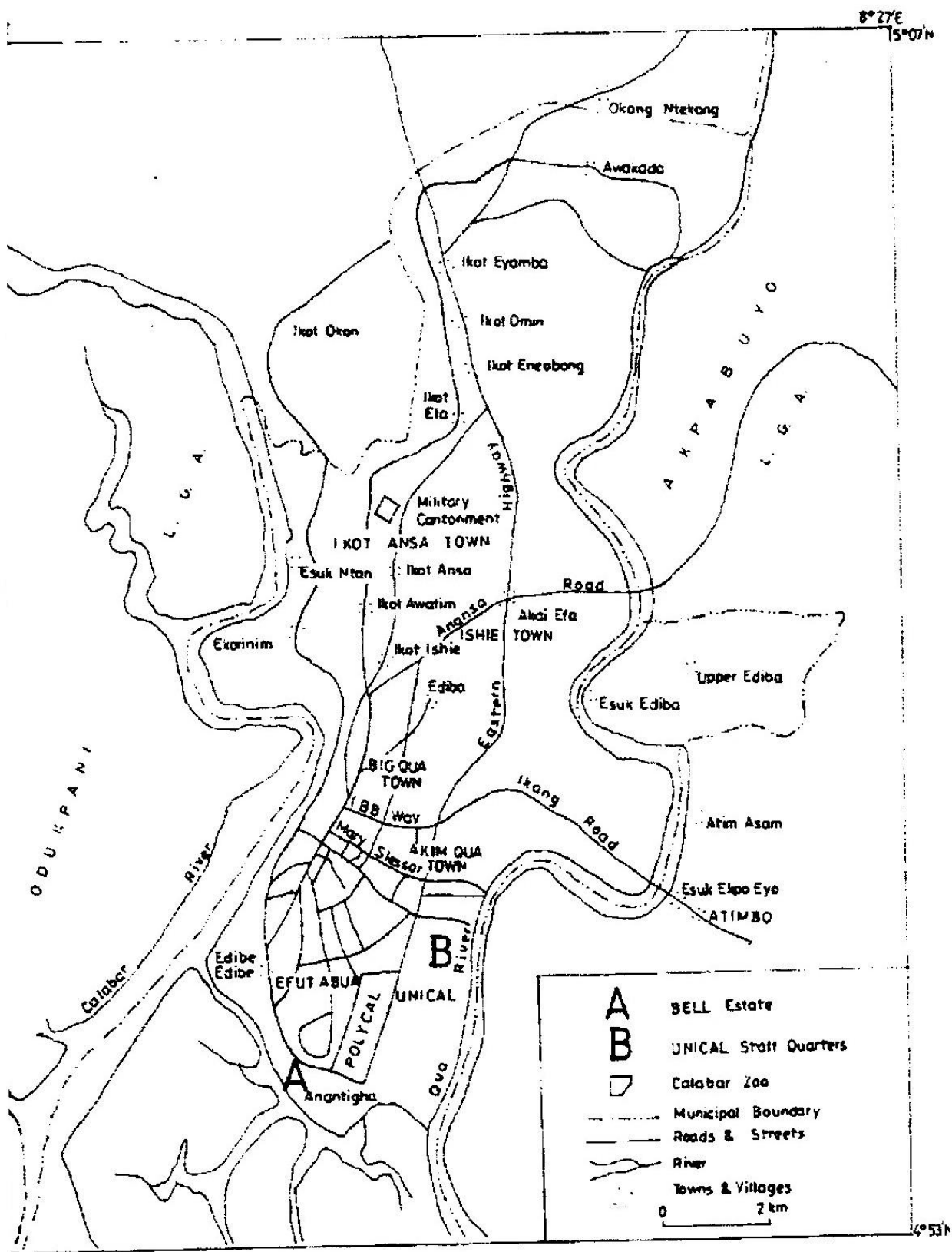
This factor alone amplifies the roles of temperature in the occurrence of this disease which affects children more than any other group of people. The four dry months of November, through February account for about 60% of the cases of the measles reported in Calabar.

The trend observed in the occurrence of this disease is that of an increase towards the dry months and a decrease towards the rainy season. During the wet season, spanning seven months (April - October) the number of cases of measles dropped from 106 in April to 88 in May and increased to 154 in October.

Figure 2 shows the pattern of this disease by month. It is apparent that the dominant climatic conditions during the periods of high incidence of this disease are high temperature and low relative humidity. Figure 3 shows the pattern of the climatic parameters. A careful observation of the pattern of the spread of the disease shows a close relationship between the disease and the season.

Conclusion

This study reveals that measles follows a defined pattern in the humid tropics. The peak is in the dry months. This calls for attention of public health officers to be alert during the dry months and prepare to tackle the increased cases of measles as the dry months approach.



1: CALABAR MUNICIPALITY

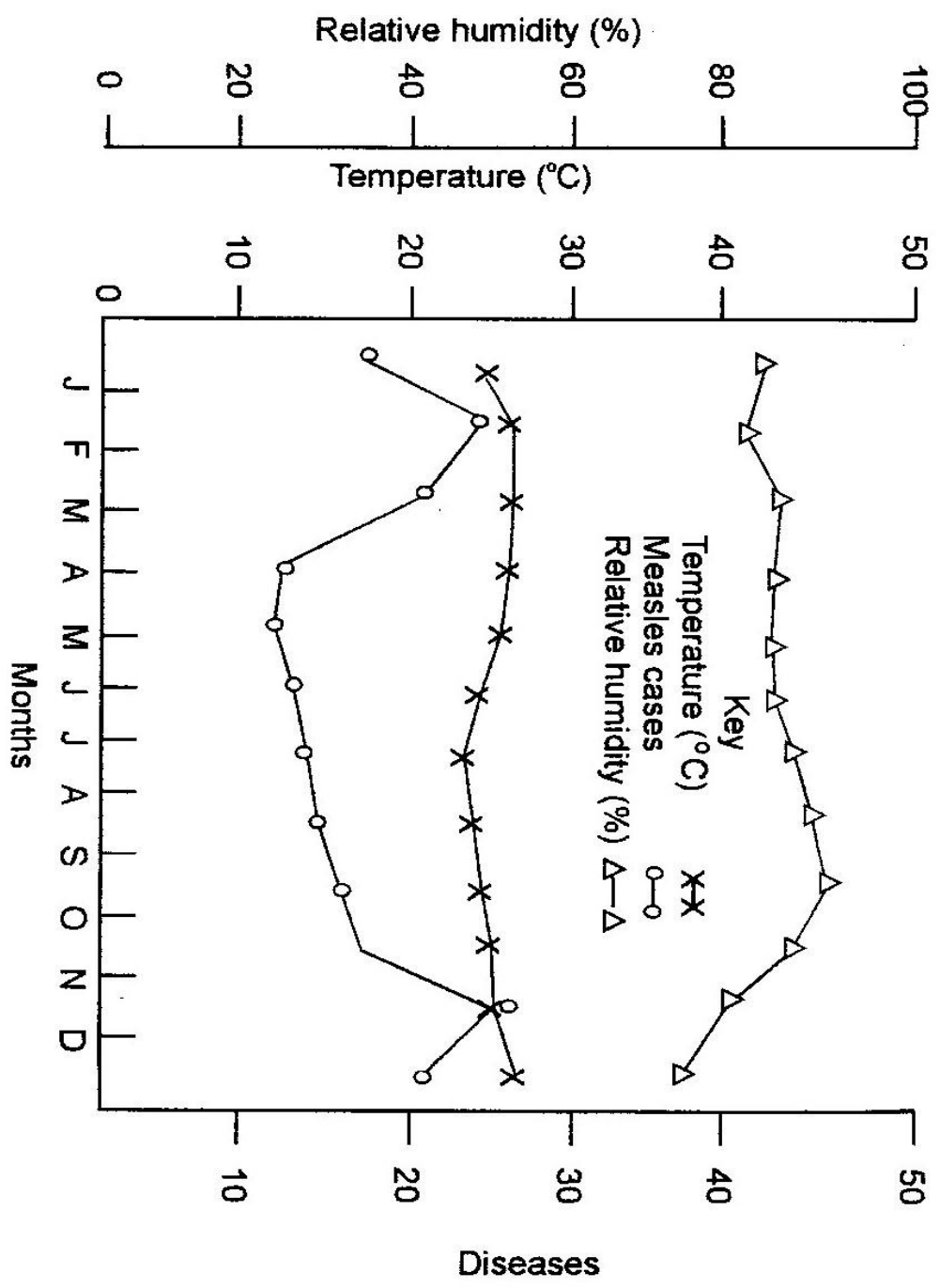


Fig. 2 Variation of measles, cholera and relative humidity and temperature.

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