

EPIDEMIOLOGICAL CHARACTERISTICS OF MEASLES IN WEST AND CENTRAL AFRICA

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Seasonal Distribution

In this area measles is a disease of dry season epidemics (figure 1). The rains stop in September; after two to three months, measles epidemics appear and increase in frequency until May and June when the rains begin again. This pattern probably depends on the mobility of people. Markets, festivals, visits to relatives, etc., are dry season diversions; planting and cultivating during the rains keep people in their own villages.

Age Distribution

In all but the most remote areas, measles is a disease of the first two years of life (figure 2). In urban Africa, 90% of cases occur in children less than two years old. However, the data from the Western State in Nigeria indicate a somewhat later age of attack in less densely populated areas. Only in the remote areas where measles is probably an infrequent visitor, does the age pattern approach that of the USA. For example in the Kouapouli (Central African Republic) epidemic of 1967, the age distribution of cases and age specific attack rates suggest an interval of five to seven years since the previous epidemic (table 1).

The influence of population density on the age distribution of measles in Cameroon is shown in table 2. The rate of transmission appears to increase as the population density increases.

Various reasons are given for the high incidence of measles in very young infants in Africa. Morley suggests that the universal practice of carrying of infants on the mother's back expands the opportunity for contact. The extended family system and the intimacy of village life also augment the chances of infection. The occurrence of measles so early in life presents difficult problems to those who would control the disease through immunization.

Death/Case Ratio

While of relatively less importance to the epidemiology of measles control, the death/case ratio is critically important in understanding the emotional and political impact of measles control programmes. As shown in table 3, measles is most lethal in the infant, but extorts a high death toll even in the older preschool child. Grigsby cites a case-fatality ratio of 14% for hospitalized cases in Ibadan. Rosenbloom reported a death/case ratio in Cameroon in 1965 of 10.5%, sufficient for measles to rank second only to malaria as a cause of death in children. There is no evidence that the etiologic agent is different from that in the USA nor that variations in host immunity play a significant role. The high death/case ratio in Africa appears to relate to the young age distribution of cases and the presence of malnutrition.

In summary, measles in West and Central Africa generally occurs as an epidemic disease of the dry season. Most children in urban areas have had the disease by two years of age, and a somewhat later age distribution is observed in rural areas. Measles transmission appears to increase as population density increases. Measles is a lethal disease in this area, being associated with mortality rates of 10% to 15% in hospitalized cases. This high mortality is believed to be the result of malnutrition, which is often most severe in the very age range in which measles most frequently strikes.

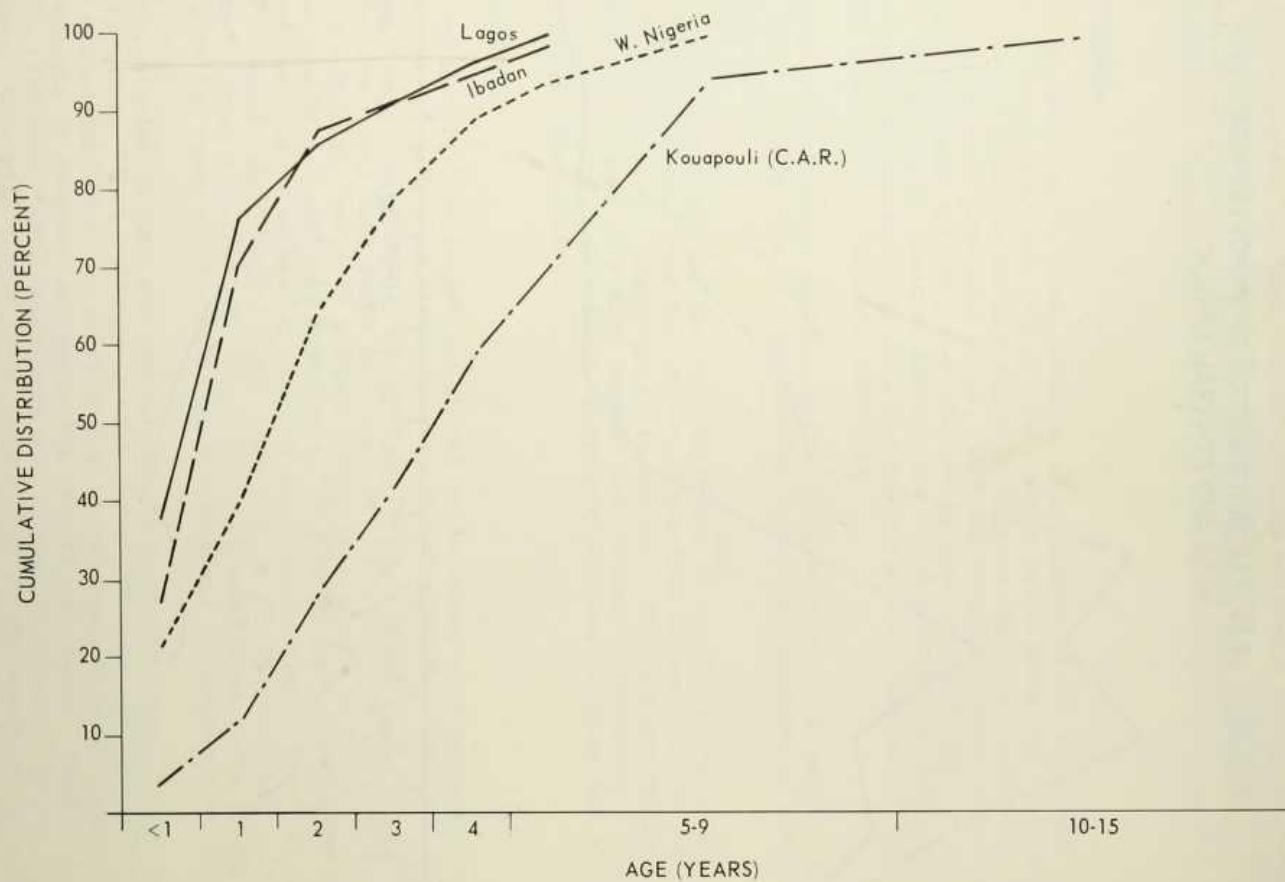
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FIGURE I. SEASONAL DISTRIBUTION OF REPORTED MEASLES,
WEST AND CENTRAL AFRICA*



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FIGURE 2
 PERCENT DISTRIBUTION OF MEASLES CASES BY AGE
 FOR FOUR AREAS^{1,2,3}



1. Grigsby, M., Personal Communication (Western Nigeria)
2. E. A. Smith and S. O. Foster: To be published (Nigeria)
3. Durand, B. and N. H. Ewen, (Personal communication (Central African Republic)

Table 1

Measles Epidemic, Kouapouli, Central African Republic* (October 1967)
 Percent Distribution of Cases by Age and Age Specific Attack Rates

<u>Age (Yrs.)</u>	<u>Total Residents</u>	<u>Attack Rate (%)</u>	<u>Cases</u>	<u>Percent Distribution of Cases</u>
<1	34	32.4	11	3.4
1	32	87.5	28	8.8
2	57	89.5	51	16.0
3	53	84.9	45	14.2
4	62	85.5	53	16.7
5-9	179	62.6	112	35.2
10-15	93	19.4	18	5.7
Total	<u>510</u>	<u>62.4</u>	<u>318**</u>	<u>100.0</u>

* An Area of subprefecture of Nola (pop. density 1.1 persons/Km.²)

** Excludes one case in 25 year old person.

Table 2

Measles, Cameroon, (1965)
Cumulative Percent Distribution of Reported Cases by Age and
Population Density of Reporting Area.

Area Density (per Km. ²)	Cumulative Percent Distribution by Age				Case Total
	<1	1-4	5-9	10+	
<10	15.5	62.2	89.8	100.0	19014
10-40	20.7	63.2	90.2	100.0	19337
40-80	22.7	73.4	90.9	100.0	9435
80+	26.8	84.6	94.9	100.0	16825

Table 3

Measles Epidemic
Kouapouli, Central African Republic* (October 1967)
Death/Case Ratios by Age**

Age (Yrs.)	Cases	Deaths	Death/Case Ratio (%)
<1	11	3	27.3
1-2	79	11	13.9
3-5	134	7	5.2
6+	94	0	-
Total	318**	21	6.6

* An area of subprefecture of Nola (pop. density 1.1 persons/Km.²)

** Excludes one case in 25 year old person