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THE TRUE DISEASE PATTERN IN EAST AFRICA PART I  
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## THE TRUE DISEASE PATTERN IN EAST AFRICA PART I

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### SUMMARY

Generally, most disease episodes are of short duration and cause little disability. They are mainly subject to self-care and rarely appear in routine reporting systems. In East Africa, however, even serious diseases with severe or long-lasting disability remain unrecorded and unreported, as only a minor proportion of such conditions are seen at modern health care facilities. Official morbidity statistics thus present a very distorted picture of the true situation. This article, the first in a series of two, tries to present a more accurate account of the East African disease pattern on the basis of sample survey findings, routine statistics, and other relevant data. Many of the estimates are very crude and must be seen as 'informed guesses', subject to revision as more complete and reliable data become available.

### INTRODUCTION

Most episodes of ill-health in an African population remain unrecorded and unreported. Official morbidity statistics therefore reflect only a minor part of the truth. The situation can be illustrated by a hippo, most of which remains invisible under water. It is true that a large number of disease episodes are unimportant and hardly worth recording, but in East Africa a very large portion of the important and severe morbidity also goes unrecorded.

This paper is an attempt to estimate the true morbidity and mortality in an average East African population of 100,000 people. Routine morbidity reports from health facilities are incomplete and rather inaccurate. It has therefore been necessary to estimate morbidity and mortality on the basis of sample surveys both in East African and in other populations, in some cases even outside Africa. The fact that these are the most reliable and valid data available is a good reason for including more population-based morbidity and mortality surveys in Africa's health information systems. Sample surveys in selected areas may, in fact, be the only way of obtaining a reasonably true picture of the actual morbidity in any given African population.

*Definitions* of ill-health vary from one study to another and there seems to be no generally agreed boundary between unimportant signs of discomfort and actual disease. Every study seems to adopt its own definition, and WHO's definition of health as 'a state of complete physical, mental and social well-being and not merely the absence of infirmity' is extremely wide and difficult to use for measuring the amount of ill-health in a community.

*Incompleteness of data* is a problem mainly associated with routine reporting. Occasional surveys can compensate for gaps in such reports. Some of the notifiable infectious diseases as recorded in Kenya 1980 (1) can exemplify this problem, although the problem is basically the same in other countries.

Most episodes of ill-health are subject to self-care within the household, usually with no active medical intervention at all, but sometimes these are treated with traditional methods or with drugs obtained from the nearest local shop. This is likely to be adequate in 3 cases out of 4, as most illnesses are self-limiting and fade away within a few days with or without treatment of any kind.

Fig. 1

*Like the Hippo, most ill-health remains under the surface, unrecorded and unreported*

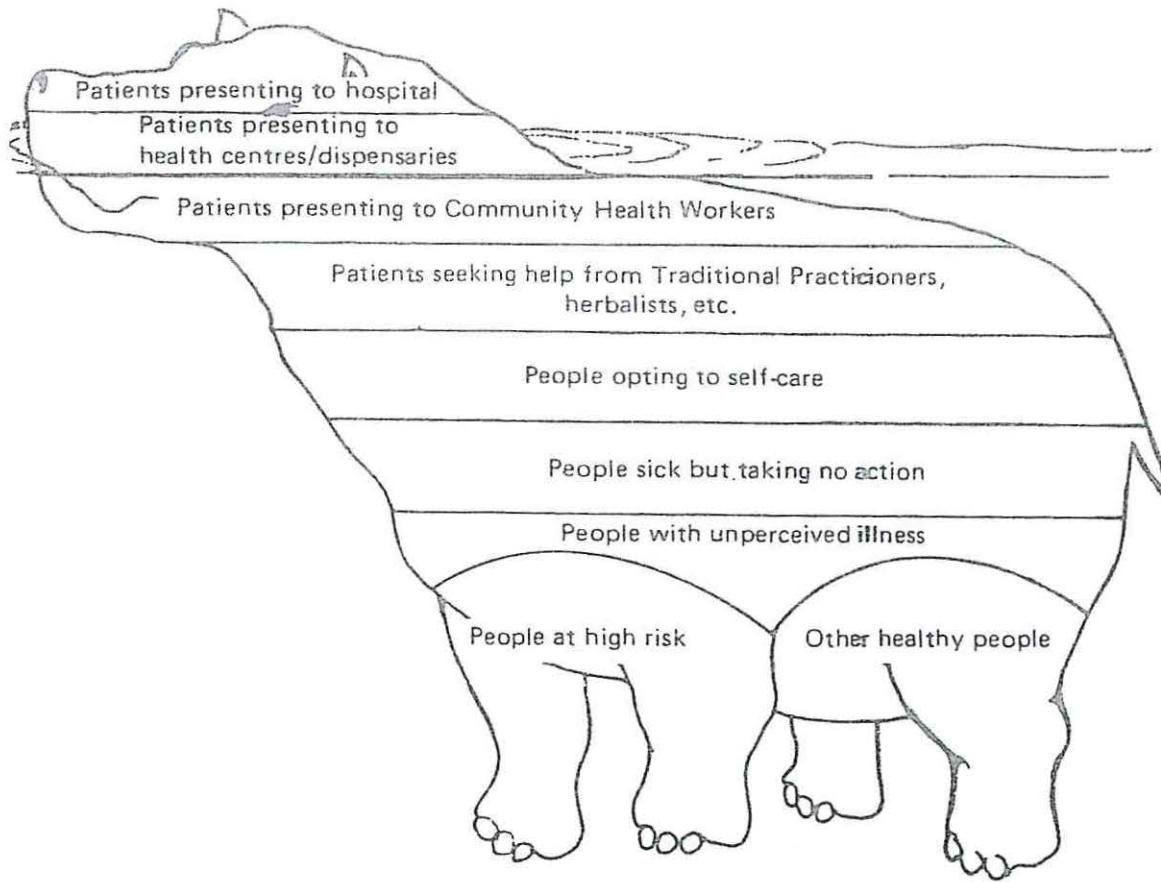


Fig. 2

*Most illnesses are subject to no action at all or to self-care*

35%		50%		10%	3%	0.5%	1.5%
No action	Self care	Trad. Pract.	H C dispensary	Hospital	Other		

*Diagnostic inaccuracy* reduces the value of routine morbidity reports everywhere, but particularly those from dispensaries, health centres and other small peripheral health institutions. Rural health facilities in eastern Africa are often run by inadequately trained staff, and this affects diagnostic accuracy. Too often this untrained staff try to manage 100-200 or more outpatients before lunch, thus spending an average of 1-3 minutes per patient on history-taking, physical examination, decision making, personal health education, and recording of data on the OPD card. Most rural health facilities have no laboratory support whatsoever; referral to the nearest hospital laboratory is time consuming, expensive for the patients, and also rarely popular with the patient concerned. It is not surprising that the diagnostic accuracy is unsatisfactory under these conditions. Morbidity statistics as reported are therefore very unreliable. Much is simply guesswork of little value.

**Incidence and prevalence of common conditions:** *Accidents* are common among older children and young adults, and data from African countries indicate that 20-40 children per 100,000 in the age group 1-4 years die from accidents each year. For each fatal accident there are several hundred non-fatal ones and two or three accompanied by permanent disability. We can conclude that in an East African population of 100,000 there are 15,000-20,000 accidents of some sort during one year (2). Of these 50-60 are fatal and 50-100 associated with permanent disability.

In the UK the annual consulting rate for accidents is 8000 per 100,000 population, divided between lacerations (4000) 'sprains and strains' (3000) and 'other accidents' (1000) (3). These other accidents probably include fractures, and the hospital admission rate for fractures in the UK is about 400 per 100,000 per year. The total incidence of fractures is unknown. Studies in Nigeria (4) have shown that men get fractures twice as often as women and that accidents involving fractures usually occur at home (49%) but that traffic accidents (20%), accidents at school (18%) and in industry (16%) are also common. Over half of the fractures seen in Nigeria occurred in children under age 10. The most common fracture sites were humerus (26%), radius plus ulna (17%), femur (10%) clavicle (8%), tibia plus fibula (7%) and hand bones (4%). A reasonable guess is that there are between 100 and 200 fractures per year, half of which need some form of skilled management.

The incidence of snake bites is also very difficult to estimate. Studies in West Africa have concluded that there are 50-500 bites annually per 100,000 people and that the case fatality rate is around 5%. The incidence seems to be higher in sparsely populated areas and considerable variations are likely in East Africa too (5). Only a small proportion of all accidental injuries are ever seen at health facilities and we can assume that less than half of the cases in need of medical attention actually get it.

*Acute abdomen* is probably several times more common in an African than in a European population and the incidence can be estimated to be in the order of 1000-2000 per year in a population of 100,000. Acute abdomen in males in eastern Africa usually means intestinal obstruction, and a strangulated hernia of the indirect type is the most common cause (6). In Europe there are about 30 perforated or bleeding peptic ulcers in a population of 100,000 per year (7) and there seems to be no firm evidence that the incidence is lower in eastern Africa (8). In women, gynaecological/obstetrical conditions dominate and we can expect some 50 ectopic pregnancies (9) and 20 uterine ruptures annually in a population of 100,000 (10). Appendicitis is much less common in Africa than in Europe, although the incidence is increasing particularly in urban areas; they are likely to be 10-15 cases per 100,000 people per year in East Africa, and many of these never seek care at health facilities (11).

*Blindness*, defined as visual acuity of the better eye less than 3/60 in the WHO system, is present in 0.5-2.0% of East Africans. Another 2% have impaired vision between 3/60 and 6/18. This means at least 1000 blind people and 2000 with impaired vision in an average East African population of 100,000. The most common causes are senile cataract (43%), eye infections and glaucoma (14%). Visual loss is strongly related to age; only 0.1% of below age 20 suffer from visual impairment while 30% of those above 60 do so (12).

*Cancer* is generally associated with old age, although some malignancies such as leukaemia and Burkitt's lymphoma are also common in young children. A relatively small proportion of an African population, 5-10%, is above 65 years of age, and the incidence is therefore lower per 100,000 people in Africa than in industrialized countries.

Table 1 gives the world's highest and lowest recorded rates and estimates for an average East African population.

Of *cardio-vascular diseases* in East Africa about 30% are hypertension, 20% are rheumatic, 15% are cardiomyopathies, 4% are congenital, and there are a few per cent each of pericarditis and of arteriosclerotic heart disease. Of those above 15 years of age 2-3% have hypertension, and this corresponds to about 2000 people in a population of 100,000. We can expect about 5-10 new cases of congenital malformations of the heart per year in the same population, most of them ductus arteriosus, septal defects, and pulmonary stenosis. We can expect about the same incidence of ischaemic heart disease. Coronaries are few, probably less than ten in a year.

The incidence of stroke is 30-40 per 100,000 population per year in industrialized countries, usually associated with old age, arteriosclerosis and hypertension. None of these conditions are common in eastern Africa, and 5-15 strokes per year is a likely incidence here (14).

*Congenital malformations* are often minor and functionally unimportant. Major abnormalities occur in at least 2% of all births in the UK (15) but the incidence increases to over 3% if the children are monitored carefully up to the age of 10 (16). The incidence recorded in Dar es Salaam is lower (17). If we assume that the average East African incidence is slightly lower than in the UK we can expect 100 new congenital abnormalities in a population of 100,000 if followed carefully up to age 10 (Table 2).

Table 1  
*New cancers per 100,000 population per year*

Site	Males			Females		
	World's highest (13)	World's lowest (13)	East Africa (est.)	World's highest (13)	World's lowest (13)	East Africa (est.)
oesophagus	24.7	0.2	10	10.7	0.2	2
stomach	100.2	3.7	15	42.3	2.0	3
colon	31.4	0.6	5	27.4	0.7	5
rectum	22.6	1.5	5	13.4	1.0	3
liver	34.4	0.9	30	9.1	0.4	8
lung	105.7	1.1	20	48.8	0.1	5
bladder	30.2	3.0	10	6.0	0.5	2
prostate	58.6	0.8	5	—	—	—
breast	1.1	0.2	0	76.1	11.8	15
cervix uteri	—	—	—	52.9	3.9	10
corpus uteri	—	—	—	35.8	1.4	5
All sites*	368.0	76.3	125	308.3	75.9	80

Table 2  
*Congenital abnormalities per 100,000 population per year in East Africa*

Type of abnormality	Number	
	per 1000 births	per 100,000 pop (= 4000 births)
Heart defects	5	20
Spina bifida	2	8
Hip dislocation	3	12
Anencephaly	2	8
Talipes (club foot)	2	8
Down's syndrome	1	4
Hypospadias	1	4
Cleft lip or palate	2	8
Hydrocephalus	2	8
Other	5	20
Total	25	100

*Deafness* occurs in 2-3% of the population, i.e. 2000-3000 in a population of 100,000. 30-40 of these are deaf-mute, and 300-400 are totally deaf to all natural speech. Some 2000 people will have difficulty hearing normal direct speech without hearing aids. Middle ear infections contribute a great deal to the total prevalence of hearing loss. European studies have shown that 12% of children under ten years of age have middle ear infections every year. Most of these infections are associated with a certain degree of hearing loss, which in 12% of the cases becomes permanent (18).

*Deliveries:* A birth rate of 40-50 per 1000 population per year corresponds to 4000-5000 births annually in a population of 100,000. Twins can be expected in 70-75 of these, 30-50 pregnancies per year are ectopic, and 20 cases of uterus rupture can be expected, usually with a high fatality rate. 15-25 maternal deaths are likely to occur during a year due to haemorrhage, toxæmia, abortion and sepsis. At least 20% of all pregnancies end in a spontaneous abortion. Legally induced abortions are very few, and only a few per cent of women of reproductive age use contraceptives (19). Illegally induced abortions are probably common, and 700-1000 induced abortions per year in a population of 100,000 is a reasonable estimate.

It is estimated that over 90% of Kenyan primigravidae have a small gynaecoid pelvis, mainly due to malnutrition during early childhood (20). However, the incidence of low birth weight in eastern Africa is only around 15%, and this combination of small pelvis/normal birthweight is causing obstetrical problems. Over 70% of deliveries carry increased risk, according to accepted criteria, and there is clearly no way in which the present service system can provide hospital delivery to such a large proportion.

*Diarrhoea* is very common, particularly among small children. Five hundred episodes of diarrhoea per 1000 population per year is a likely incidence figure, although considerably higher figures have been published. About 10% of cases are severe enough to require hospital or health centre admission, and 2-3% of cases are fatal. In an average population of 100,000 we can expect 40,000 diarrhoea episodes per year among children under five and some 20,000 episodes among children and adults. Of these cases 15,000-20,000 would require a visit to an outpatient service of some kind and 5000-10,000 cases would need admission. Only 3000-4000 cases are brought to a modern health facility for help, however, and many of these are not particularly severe. Two thousand deaths per year from diarrhoea are likely to occur in a population of 100,000 unless early oral rehydration becomes widespread at household level (21).

*Epilepsy* is not a well-defined condition, but convulsive fits of the 'grand mal' type account for nine cases out of ten and are fairly easy to identify. The prevalence in Africa is much higher than in Europe and estimated to be between 1.4 and 14.7% in different studies, which means that several thousand individuals in a population of 100,000 have some form of epilepsy, nearly all of them in the form of grand mal (22). Few of these are under regular treatment, and they have, therefore, many more frequent attacks than epileptics in industrialized countries.

While in the UK the annual number of epileptic attacks is estimated to be 3500 per 100,000 population the number is likely to be several times higher in Africa. A total of 20,000 attacks per 100,000/year seems realistic, and many accidents, such as severe burns, are caused by these attacks.

*Gonorrhoea* is common and underreported. An estimated incidence of 20 diagnosed cases per year per 1000 adults would correspond to about 2000 annual cases in a general African population of 100,000 (23). No more than one out of ten cases seek care at a modern health facility. We can assume that most cases of sexually transmitted diseases, including gonorrhoea, are never diagnosed or recorded and that few patients get adequate treatment. A common complication in females is pelvic inflammatory disease of which each episode carries a 20% risk of infertility. Repeated episodes, most of which are treated inadequately if at all, are associated with an over 50% risk of infertility. It can be assumed that 10-20% of women over 30 years of age are sterile and that few of these have already born the desired number of children. In many countries chlamydia is a more common cause of sexually transmitted urethritis than the gonococcus, but its incidence in Kenya is not known.

*Hepatitis A* affects almost everybody in early childhood although very few of these infections are ever diagnosed. Most infections are mild or subclinical and these cases are rarely diagnosed. The incidence of moderate or severe hepatitis is at least 100 cases per year per 100,000 people, with the highest incidence among children under 15. The incidence of mild or subclinical cases is probably several thousands. Hepatitis B carrier rate, which in western Europe and the USA is less than 0.5% and in Latin America 1-2%, is over 10% in Africa (24, 25). The reasons for this and the transmission routes are not known. We can conclude that there are several thousand cases of hepatitis A as well as B per 100,000 people per year, but that no more than a couple of hundred cases are severe or in need of care at health facilities. The number actually seeking such help is smaller than that, or 25-50 per 100,000 per year in Kenya.

This article is the first in a series of two.

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### Omission

East African Medical Journal 59: 524. 1982

Dr. H.L. Reids' article entitled Plasma Fibrinogen Levels In Nigerian (IBOS): Normal Adults, pregnancy and fetal cord blood.

Paragraph omitted end of Materials and Methods after....decanted.

The fibrinogen concentration was then determined by the clot-weight method described by Ingram (8). All determinations were made on the same day of collecting the blood. The haematocrit was measured by micro-haematocrit capillary tubes and micro-haematocrit centrifuge. Measurements were made in duplicate and the mean value calculated for both citrated and heparinized blood.

Also on page 525. Correct Table 1 as follows:

**Table 1**

*Plasma fibrinogen concentrations in non-pregnant and pregnant women during the three trimesters of normal pregnancy.*

Group	Number	Fibrinogen (g/l)		
		Range	Mean	± S.D.
Non-pregnant women	30	1.38 - 4.10	3.15	0.50
Pregnant women	222			
1st trimester	49	2.0 - 5.59	3.74	0.73
2nd trimester	98	1.39 - 7.15	3.61	0.83
3rd trimester	75	2.15 - 5.02	3.76	0.74

### Correction

East African Medical Journal 60: 126. 1982

Dr. W. LORE's article entitled Practical Therapeutics: An approach to the diagnosis and management of venous thrombosis and pulmonary embolism

6th and 7th line from bottom of page 126 Hofman's should read Homan's - delete the "f" in both cases.