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A BRIEF REVIEW OF THE EPIDEMIOLOGY OF
VECTOR BORNE DISEASES IN SOMALIA WITH
SPECIAL REFERENCE TO MALARIA

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Introduction

Somalia, occupying the "Horn of Africa", has an area of 640 000 square kilometers and an approximate population of more than 5 million. 65 - 75% of the population leads a nomadic way of life, the rest are sedentary, living on agriculture, trade, business activities etc. 80% of the nation's exports depends on nomadic economies i.e. live animals, wool, skins and meat products. Recently other industries have been developed and with the expansion of agricultural projects and agricultural cooperative farms more of the population has become sedentary and urbanization is developing fast. Movement of the population is an important traditional feature of the way of life of most Somali people. Great emphasis is laid on road construction in an effort to develop communications.

Topographically and climatologically Somalia can be divided into three zones:

The coastal zone (Guban) which comprises the low coastal plains, sandy and almost without vegetation, extending not more than a dozen miles westwards; rainfall here is scanty and there are no water collections.

2. The irrigated southern regions and the semi-arid areas in the south, central east and north-western regions (Ogo and Haud), are the extension of the low coastal plains that exhibit higher plateaux and vegetation reaching 1 000 metres above sea level. This area has numerous water points and recently the semi arid area in these regions were provided with thousands of privately owned cement water reservoirs filled in the wet season by rain water overflow, in the dry season a good number of them are filled by tankers. Yearly rainfall in these areas reaches up to 300 mm
3. The north-western plateaux which reaches 1 500 - 2 000 m above sea-level are undulating mountain ranges with evergreen forests and a yearly precipitation of 300 - 500 mm. They have numerous water courses flooded in the rainy seasons but forming no more than trickles.

The two important perennial rivers which flow south-eastward are the main source for irrigation and are flooded during the rainy season, giving rise to numerous water bodies all along their banks. They are Juba and Shebelli rivers.

Health Status

Natural population growth is 2.9%, the high rate of refugee influx is not included. The crude birth rate is 50/1 000 and crude death rate 21/1 000. The infant mortality rate is 150 - 177 per 1 000 live birth. Nutritional problems, environmental sanitation problems especially among the rural communities, are contributory factors to the high mortality rate. Tuberculosis, water-borne diseases and other communicable diseases are other factors

contributing to the high mortality rate. Schistosomiasis is widespread in Southern Regions of Somalia, infecting 65 - 85% of its inhabitants. Malaria is another vector-borne disease still prevalent in the whole country.

The health delivery system, until recent years aimed towards building and establishing hospitals in urban areas, while the rural population was served through the vertical programmes. But, however now the National Policy of Health is based on Health for All by the Year 2 000, this is reflected in the 5 Year Plan of 1980 - 1985, giving high priority to rural health through the Primary Health Care System.

Vector-Borne Diseases in Somalia

The Somalis are naturally gifted with good health, fortunately the main tropical African endemic diseases are absent in Somalia except malaria and only in recent years schistosomiasis. Recently limited outbreaks of dengue fever have occurred encounter in Mogadishu City. Of the above three diseases malaria has been extensively studied; although very briefly, a mention is made below of the epidemiology of malaria and anti-vector measures to control it. Schistosomiasis epidemiology and control methods are also briefly covered.

A. Malaria

1. Epidemiology - Malaria is widespread in the whole country; it has been and still is a public health problem with high mortality and morbidity. The epidemiology of the disease is closely connected with the geo-topographical landscape of the country, climate and the way of life of the Somali people.
11. Malaria transmission is connected with the rains, a longer late spring transmission season occurring (May - August after GU' (spring) rains) and a short autumnal transmission season (December - January after Dair (autumn) rains).
111. Distribution pattern:
 - a) The coastal low-sandy plains have no malaria.
 - b) Malaria in the southern riverine regions is stable, perennial and hyperendemic. In the semi-arid areas of these regions malaria is hypoendemic with seasonal exacerbations after the spring and autumn rains.
 - c) The central-east regions are low endemic for malaria (minimal rainfall).
 - d) Malaria in the north and north-western regions (with water courses in the mountainous parts and numerous water pools (barkits) in the semi-arid areas) is unstable, hypoendemic with exacerbations after rains. Thousands of ponds and pools (natural and man-made water collections) all over the semi-arid part of the country are the main breeding sites, for A. arabiensis.

iv. Parasite Formula 95% of the confirmed malaria cases are due to P. falciparum, P. malariae (5 - 10%) rates the 2nd and the least prevalent is P. vivax (3 - 5%).

No resistant species of P. falciparum has been encountered in Somalia

v. The Vector: A. gambiae arabiensis is the vector and breeds extensively in all types of water bodies. A. arabiensis is susceptible to DDT. An epidemiological evaluation of the malaria situation is made monthly on the basis of the slide positivity rate (SPR) At present SPR is 8% while in 1974 - 1975 SPR was 20 - 25%.

vi. Control measures

A Central National Anti-malaria Service is responsible for all anti-malaria operations, supervision and evaluation. At present the main anti-malaria activities which will be very briefly mentioned, are operated by 34 Regional Malaria Stations and Substations.

1. Case detection: Fever cases are screened by blood sample collection and examination in NAS laboratories. The screening is performed by active, passive and epidemiological surveys.

The following table gives the number of slide examinations and positives during the last five years:

<u>Year</u>	<u>Slide Examined</u>	<u>Slide Positive</u>	<u>SPR</u>
1978	117331	14785	12.62
1979	118521	11295	9.52
1980	102974	6850	6.65
1981	91836	11647	12.7
1982	39583	3257	8.22 (6 months)

2. Treatment: Presumptive treatment, radical treatment of confirmed cases and occasionally mass during administration is performed.

3. Anti-adult spraying operations: As A.g. arabiensis is susceptible to DDT, therefore very selective focal DDT spraying is operated in two rounds at the dosage of 2 g/m² DDT 75% wdp.

4. Anti-larval operations: In the urban areas for control of mosquitoes oiling of breeding sites is in action by means of antivector units in the Municipalities. Also, larvivorous fish are utilized extensively in urban areas for this purpose

Biological Control

During the last decade much attention has been given to the use of local larvivorous fish for vector control in the malaria control programme in Somalia. During the first years of the last decade the malaria staff observed that wherever larvivorous fish were present, there were no larvae and endemicity of malaria was at its lowest point also. In fact in Mogadishu the use of larvivorous fish dates back to 1945 where Tilapia (now known as Oreochromis spilurus spilurus) was used in the cisterns and tanks and main aquaduct. These observations led us to investigate the matter more scientifically. Therefore with the assistance of WHO/TDR a research project on the impact of Oreochromis spilurus spilurus on larval density and malaria endemicity was launched in 1981, in Burao District of Togher Region in Northern Somalia.

Impact of Oreochromis spilurus spilurus on adult and larval densities and malaria morbidity in Burao

	<u>AREAS</u>	<u>Room density of mosquitoes (PSC)</u>	<u>Larvae/10 dips</u>	<u>SPR</u>	<u>No. of barkits</u>
July 80 prior to intervention	A	4.9	194	14.24	1054
	B	5.2	202	13.61	960
June 82 at the end of trial	A	0.08	0	0.11	1527
	B	3.7	27.8	7.04	962

A = Area with fish introduction

B = Area without fish

P.S.P. = Pyrethrum Spray Catch

S.P.R. = Slide Positivity Rate

The trial area is semi-arid, water sources are "Barkits" (underground cement water tanks) that are filled during the rainy season from rainwater overflows through small diversion canals. Water remains in these tanks for 6 - 8 months and when dry (during the end of dry season) most of them will be filled by water carrier vehicles (private enterprise). In Area A 13380 fish were introduced initially, replenishments were made whenever required. Area B was left without fish.

The achievement was remarkably satisfactory and at the end of the trial in June 1982 it was scientifically substantiated that Oreochromis spilurus spilurus can be highly recommended for use on a country wide basis as an efficient biological larval control agent reducing larval densities and thereby malaria morbidity, especially among the mobile nomadic communities who suffered for ages from the menace of malaria.

With the experience and knowledge gained from the Burao Trial another research

project on the impact of local fish (Nothobranchius of which a number of species are present) will be launched in 1983 - 85).

In addition to the above activities, the National Anti-malaria Service is engaged in training, public health education and other aspects of a malaria control programme. The objective is to curb the flourishing malaria in the countryside reducing it to lower rates than the present ones.

B. Schistosomiasis

Schistosomiasis infects up to 90% of the population in some localities. The disease is prevalent in southern riverine regions of Somalia. These areas are exploited by extensive irrigation systems. The present level of prevalence is 53% in southern districts. The disease badly affects the health of the agricultural workers in these areas, causing great economical loss. The parasite is exclusively, S. haematobium. The existing control measures are mainly focused on treatment of cases.

C. A few words on Urban Vector Control in Somalia with reference to Mogadishu

Responsibility for vector control in urban areas lies with the Municipalities. The Municipality Health Department has a section of vector control in its setup, staffed by sanitarians. Anti-larval operations (oiling and fish distribution), anti-fly operations (fogging and spraying of insecticides), supervision of town cleaning (garbage disposal) are covered by job description of this unit. The Social Department of the Municipality is responsible for the general cleaning operations of the town; the set-up is comprehensive and equipped with the necessary transport and garbage containers. Safe water supply and drainage of the city are operated by the Water Agency with the cooperation of the Social Department in the Municipality. Rodent Control and Port Pest Control are the responsibilities of the Ministry of Agriculture.