

History of TB in the Sudan

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Abstract

Introduction: Medical history in Sudan is far from being complete. There are no reliable records. Attempt to write on the projects and development of history of TB in the Sudan is a difficult task.

Objective: To study and trace the progress of TB in Sudan during the last century through their historical development.

Design: A retrospective study.

Methods: Data were collected from the annual reports of the Sudan Medical Services. Libraries and a number of previous studies were consulted.

Results: The route of entry of TB in the Sudan is mainly from the North. The South was virgin from TB up to 1930s. Northern Sudanese tribes have a high susceptibility and incidence of TB during 1925-1932 (3.7/1000). The south and the Nuba Mountains were almost free from infection or disease. The infectivity rate was highest in North 4.3% while Khartoum showed 3%. In the South, Rumbek district, no TB cases were reported before the age of puberty up to 1930.

Prevalence of tuberculosis in 1959/1960 was 26.0% and the detection rate was only 30%.

Conclusion: Northern Sudanese contracted tuberculosis while serving in the Egyptian army and cities. The Southern and Western tribes who were almost free from TB infection became highly susceptible to both infection and disease. The infectivity rate remains static during the last 50 years.

Keywords: Sennar, Nuba Mountains, Darfur, Kassala, Mediterranean.

Purner (1884) working in Egypt observed that tuberculosis became rarer and rarer as one proceeded southwards from the Mediterranean. He said “in the both central and upper Egypt the disease was decidedly uncommon. Then it increased in both Khartoum and Sennar” .Since then only fragmentary reports and remarks on tuberculosis appeared in the medical records and literature.

Before 1885 TB was not reported as one of epidemics of the Sudan. These include sleeping sickness, small-box, relapsing fever, cerebrospinal meningitis and cholera. These epidemics classically swept and devastated a geographic belt across the central part of

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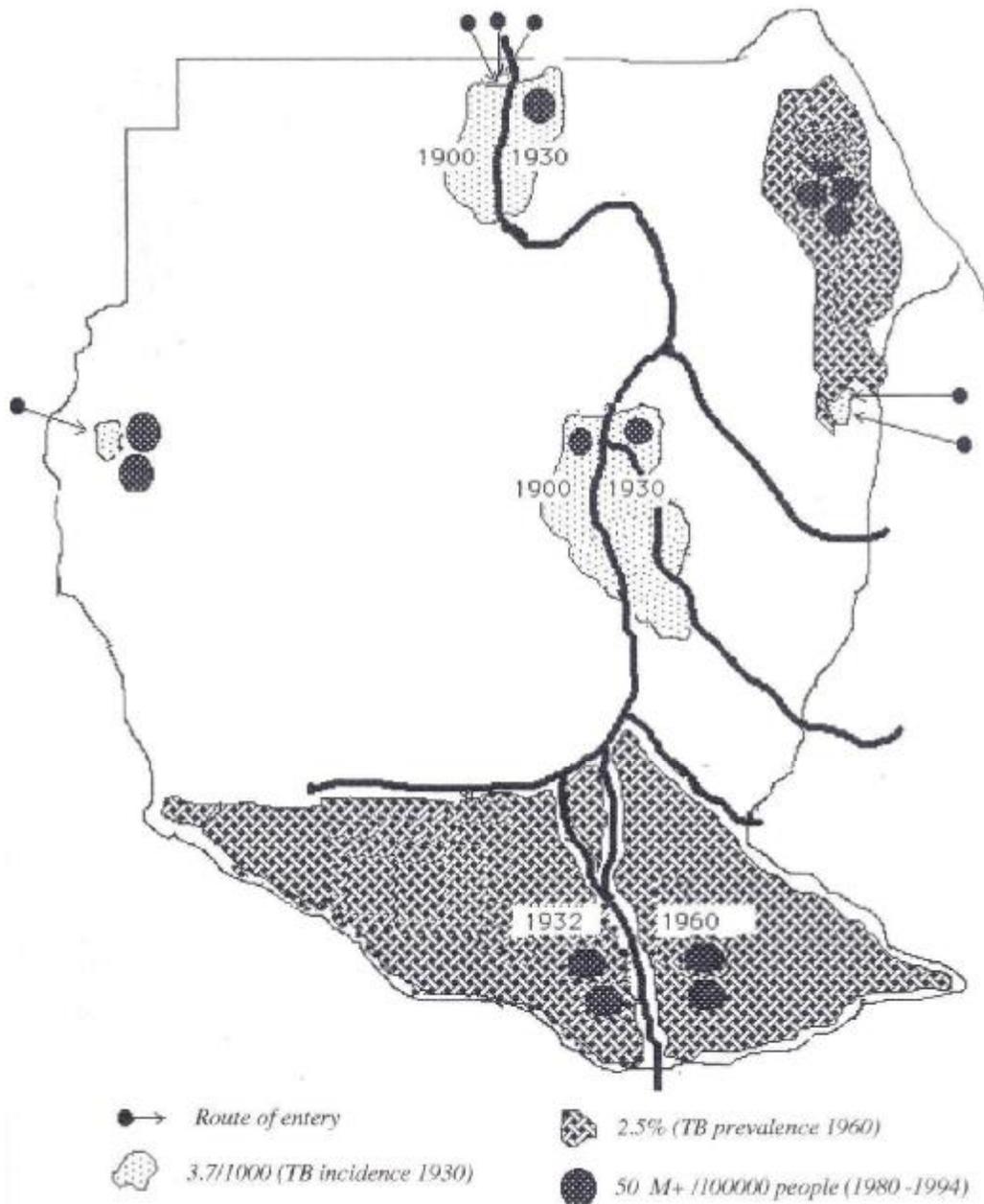
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Africa including the central provinces of the Sudan; Darfur, Kordofan, Blue Nile, Khartoum and Kassala. This is so called “Epidemics belt of Africa”¹.

Von Becker (1904) drew attention to the very low incidence of TB in Egyptian in contrast to the very high susceptibility of those coming from Northern Sudan (Berber); especially when they are subjected to hard and harsh living conditions in Egypt². It was quite common for northern Sudanese working in Egypt to return home heavily infected with pulmonary TB. Again in 1946 Cummins reported that Sudanese soldiers from non-endemic areas contracted the disease while serving in Egyptian cities. He formulated his “virgin soil” theory. This postulated that insolated primitive communities were much more susceptible to infection than the more developed communities. Route of Entry (Fig.1).

Fig.1
History of tuberculosis in the Sudan



The report of 1905 on the finance and administration of the Sudan stated the following:-

“It may be noted how susceptible the native is to mycobacterial disease. At the same time, how non – resistant he is to it. Up the White Nile and the Blue Nile it is full of Malaria. At

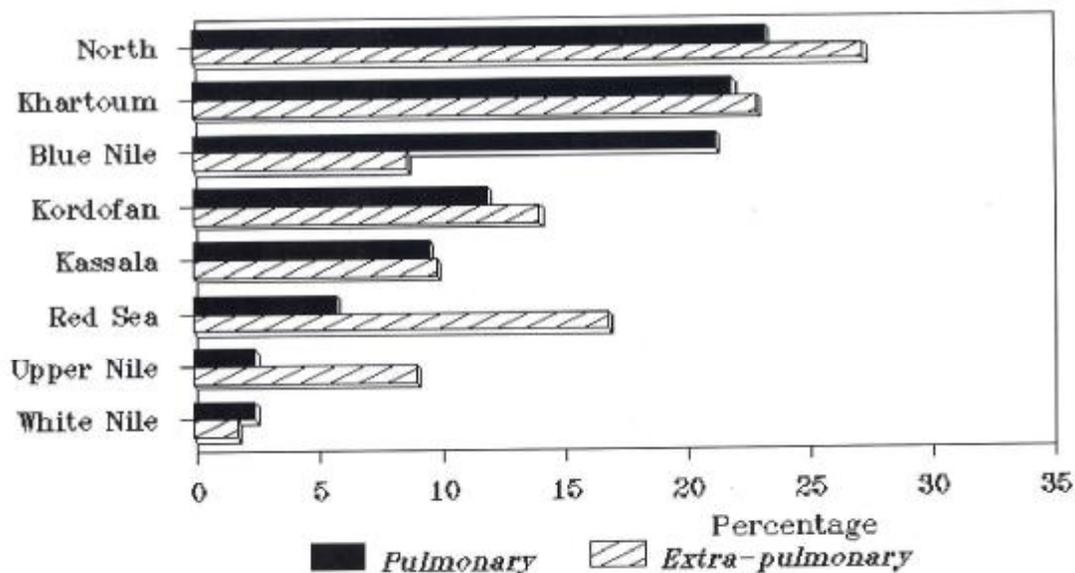
Omdurman and Khartoum there is considerable amount of tuberculosis, in children, and osseous and pulmonary in adults” The last two equally fatal. In the military personnel Cummins reported (1906 – 1907) small average annual incidence of only 1.5/1000 of TB among Egyptian soldiers. In the Sudanese soldiers this was more than tow folds (3.7/1000). These were mostly from the Dinka tribe³. Balfour in 1904 and Archibald in 1922 referred to the susceptibility of Sudanese tribes to respiratory diseases in general and TB in particular⁴. Balfour stated that “Pulmonary TB is very common amongst the native Sudanese”.

He attributed this to the fact that they live in poorly ventilated houses. These were so planned as to exclude the powerful sun rays. Smith in 1909 noticed the high susceptibility of Sudanese soldiers to TB in contrast to virtually complete absence of the disease in their natural habitats. He also referred to corresponding absence of TB in Sudanese

herds of cattle⁵. It became evident that, isolated tribes of the Sudan e.g. the south and the Nuba mountains were almost free from infection or disease during this period, but they were very highly susceptible to both infection and disease. In the Red Sea and Kassala provinces considerable number of immigrants from surrounding, Ethiopia and Eriteria, enter the Sudan heavily infected with pulmonary TB. They still do. There were also nomads from Saudi Arabia who were infected with TB.

Studies on infectivity of TB were conducted in various provinces of the Sudan between 1918 and 1930; Dongola showed the highest infectivity rate of 4.3%, Khartoum province showed almost 3%. 50% of all patients in Khartoum came from other parts of the Sudan , mostly from the Northern province , they used to come to Khartoum seeking medical treatment which was not available elsewhere⁶ Fig.2

Appendix Fig.2 Number of TB cases in each of Provinces of the North and Central Sudan 1932



Adapted from M. of H. Annual Report 1932

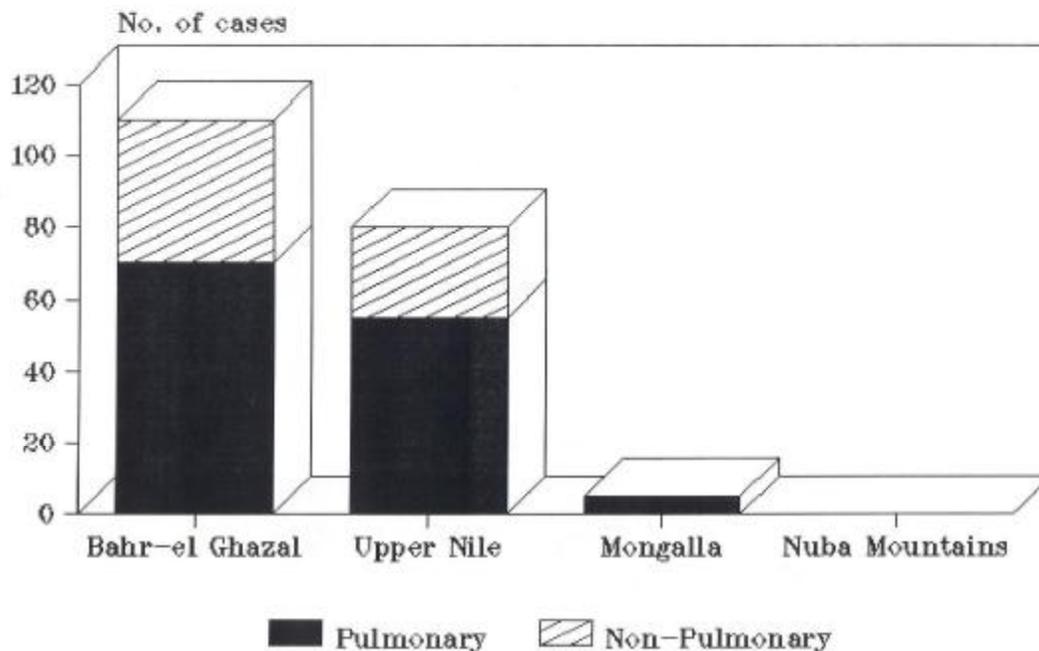
TB in South of Sudan:-

The earliest tuberculin surveys (1925) were done using the Von- pirquet technique. They showed that TB was commoner in settle populations and in crowded towns. In 1929 a survey of the Nilotic of Upper Nile province showed an infection rate of only 0.2/1000⁶. In 1929 Henderson reported that TB was common with high infection rates among the Shiluks. It was much higher than the Equatorial tribes⁶. In 1930 a tuberculin survey

was carried out on 703 natives of southern provinces. It showed that the Shiluk tribe had the highest infection rate. In 1931 – 1932 Burrows studied the incidence of TB among the Dinkas of eastern Bahr-EL – Gazal. He reported an infection rate of less than 1/1000 in a population of 171,000 people.

Theodore Belsky in 1932 studies TB in Rumbek district. He stated that no TB cases were seen before the age of puberty⁶ (fig3).

Appendix Fig.3 Distribution of TB cases in the South of Sudan – 1929



Adapted from M. H. Annual Report, 1929

It can be concluded that, the very low incidence of TB infection in the south was due to non –exposure to TB infection. Strong tribal organization and leadership prevented any infiltration and thus acted as the barrier against the spread of TB to the Southern provinces. The marked difference in infection rates between the north and the South does not necessarily imply a real difference in the incidence of the disease.

People in the South are less likely to report. However, the south remained a “Virgin Soil” largely free from TB. This continued up to 1930s.

However, the rapid expansion of the disease after the 1930s was expected. There were many factors including poor or low immunity, backwardness and poor habits. They chewed tobacco, smokes the pipe and lived under conditions of overcrowding. Their

intake of proteins was very low, their food was mostly Marisa. Their nomadic life prevented exposure and therefore, immunity. But it helped them to remain largely free from TB. It is interesting to note that most of the cases studied in 1932 by Belsky in the southern provinces showed that TB lesion started in the base of the lung, there was also a high prevalence of laryngeal tuberculosis⁶.

By 1950, however, advanced cavitory TB was reported. This was typical of reactivation tuberculosis recently described in the early stage of TB in HIV- seropositives, the type and the site of TB in the body bore a striking relationship to the time since infection took place⁷.

TB and Foreigners:-

During the period 1918-1932 TB was reported among many foreigners in the Sudan. These were mostly Eriterians and Ethiopians. In 1932 these constituted 9% of all reported cases .A few cases were also reported from other foreigners e.g. Europeans, Yemeni and Somali⁶. Most of these entered the Sudan across the Eastern border.

Since the turn of the century and up to 1928, there was very little change in the proportion of admitted cases of TB to the total number of the admissions.

In 1918 this was 1.5% and in 1929 it became 1.3%. In 1932 there was an economic depression due to the collapse of prices of exported goods; this lowered the standard of living so much that it was reflected in temporary rise in TB rate. In 1932 a total of 421 pulmonary TB were admitted compared to 260 cases in 1928 and only 140 cases in 1922⁶.

The proportions of pulmonary and extra – pulmonary tuberculosis were 57% and 43% respectively.

Careful studies were extended over the third period (1950-1965) .This period witnessed increased awareness, more refined diagnosis and better notification of cases. All these coupled with increased urbanization and the escalation of war resulted in an increase in TB cases admitted to hospitals.

However, this did not reflect the true situation of the disease. Also most of these

cases were diagnosed on clinical grounds only. However, the proportion of admissions diagnosed clinically as TB kept rising during that period.

Following the start of the Second World War, the incidence of TB started to increase in the Sudan. In 1945 the number of hospital admissions reached 1600 cases. Of these 60% was pulmonary. Five years earlier in 1940 the number was only 1036. Of these 56% of cases were pulmonary.⁶ In 1948 the first envoyee (Dr Mamoun Hussein Shreif) was sent to United Kingdom for postgraduate training on TB control program within the Ministry of Health.

After the war TB became one of the most important urgent health problems in the Sudan. It was preceded by malaria and schistosomiasis. In 1949 a pilot TB program was started in Khartoum .This was based on hospitalization and adequate domiciliary treatment and careful supervision and prompt investigation of contacts of known cases.

International Agencies and TB Control (1950-1968):-

This may be called the “Golden era” of TB control in the Sudan. Many international agencies were invited by the Ministry of Health to co-operate in implementation of a TB pilot project based on tuberculin testing and B.C.G vaccination. In 1951 Dr. Mollar, a WHO expert, and Dr. Vine, advisor of public health administration, E.M.R.O. were invited to advice on the administrative and organizational aspects of the project. Then in 1953 Dr. Hoefinagels was invited to advise on technical aspects of TB control. In 1953 an agreement and a plan of operation of national tuberculin survey were signed between the Government of Sudan, WHO and UNICEF. The project was implemented in two phases. The first phase was just fact finding, the second phase was a mass campaign. A total of 64968 people were tuberculin tested in different regions of the Sudan, in both north and the south.

Post – vaccination surveys were then conducted in Equatorial and Blue Nile provinces.

The overall national infectivity rate was 53% (8). After the baseline tuberculin survey of 1954 -1955 a rising infection rate was observed. Between the year 1954 and 1955 great historical events took place in the Sudan. The Sudan was admitted to WHO as an associate member. A clinical unit of chest diseases was established in Khartoum. It was run by two specialized chest physicians. The TB control division of the Ministry of Health directed all fields' activities in both north and south.

An appreciable expansion of domiciliary treatment was achieved in 1950. A convalescent, rehabilitation centre was opened in Khartoum as a joint venture between the Red Cross and Sudan Association for prevention of TB. The Red Crescent and Sudan Association for prevention of TB were all voluntary organizations assisting in domiciliary care. By 1955 the TB beds situation was shown in table 1.

Table 1: Tuberculosis in the Sudan (1955)

Hospital	Number of beds
Khartoum River Hospital	63
Khartoum Civil Hospital	13
Omdurman Civil Hospital	13
Khartoum North Hospital	12
Hamad El-Neil Isolation Hospital (Omdurman)	67
Total	108

Adapted from the Sudan M. of H. annual statistical report

During this period the calculated incidence of pulmonary and extra- pulmonary TB doubled from a baseline of 33/100,000 in 1955 to 66/100,000 in the follow up survey of 1968⁸.

Many measures were taken .These included B.C.G vaccination, case finding mass mintage radiography, home treatment,

health education and contact tracing. These were all implemented. In the Southern regions by 1959 out of 269097 tuberculin tested⁸, a total of 105414 people were vaccinated, significant progress was made. The director of the TB division was Dr. Zain El Abdin Ibrahim. He was assisted by competent international organizations.

They were very active. They used standards methods of diagnosis and control. These included domiciliary treatment, home visiting and welfare service.

Surveillance and health education were also introduced. The Ministries of Information and of Labor disseminated widely relevant information and literature about TB. The annual budgetary allocation was sufficient to meet all these requirement and transportation as well. There were six land- Rovers and also Comer truck⁸.

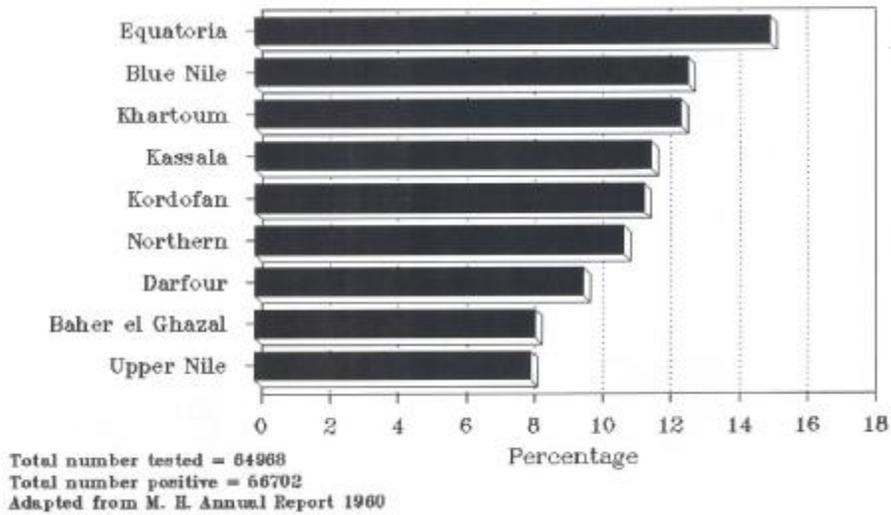
During the period 1955 -1960 a TB Demonstration centre was established in Wad Medani, by the Government of Sudan and WHO. It participated fully in training and surveillance activities.

Historically two prevalence surveys of TB were conducted in the Sudan. The first was in 1954/1955 and second in 1959/1960. Both were technically and financially assisted by the WHO. The second one studied only the prevalence of pulmonary TB in the Blue Nile province.

The overall provincial prevalence was 26.0%^{9, 10}(fig.4-6)

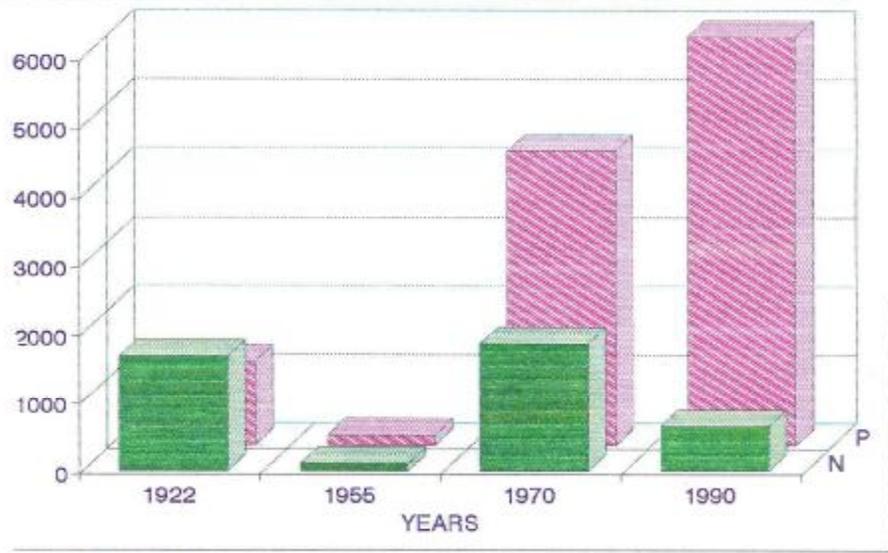
In 1963 Elthora Hospital now renamed Elshaab Teaching Hospital, was opened. Between 1960 and 1970s a network of chest clinics were established all over the Sudan. These included Abu Anga Hospital (previously called Hamad El-Neil Sanatorium), then Medani, Sennar, El-Doem, El-Gadarif, Kassala, Port –Sudan, Elfasher, Atbra, El-Obied, Nyala, Wau, Juba and Malakal. In 1970 an agreement was signed with former USSR to establish Soba Hospital for TB and Lung diseases, this was then changed to general Teaching University Hospital.

Appendix Fig.4 Distribution of Tuberculin infectivity at different provinces of the Sudan - 1960.



Appendix Fig.5

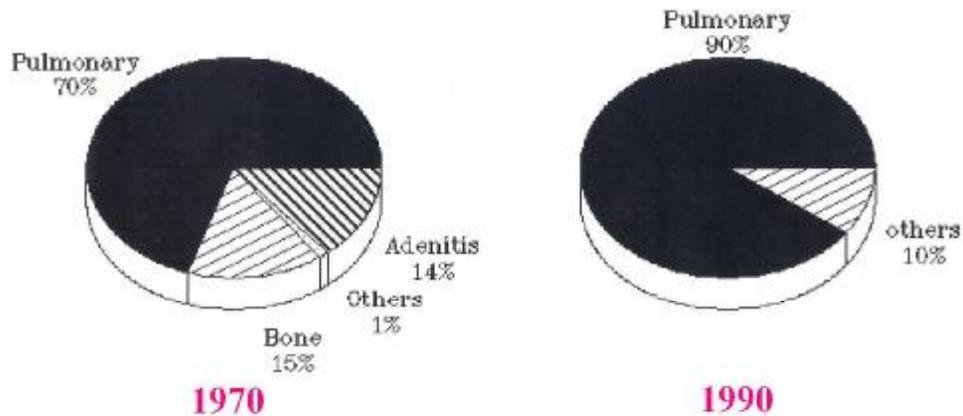
PULMONARY & NON PULMONARY TB DURING 1922--1990 IN SUDAN



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 APRIL 1993

Appendix Fig. 6

Different Faces of TB in the Sudan



Adapted from M.H. Annual Statistical Reports (1970, 1990)

Chest clinicians were responsible for case management and treatment in hospitals. The concepts of integration and preventive aspects of disease control were largely neglected. The TB division at the Ministry of Health stopped functioning. Field work came to an end. This led to low detection rates. Only 30% of expected cases were detected. Then late diagnosis, haphazard case management and high default rates supervened. This was the period of the collapse of the attempt to implement TB control program of the Sudan that ends by 1970s.

A Tuberculin survey was conducted in early 1980's by Dr Zaki in collaboration with the Joint Nutritional Support Program (JNSP). A 3.2 % risk of infection was calculated (160 infectious pulmonary TB /100,000 pop)¹¹.

International Agencies and TB Control (1986-2006):-

A national tuberculin survey was conducted in 1986, an estimated risk of infection is found to be 1.8% (180/100,000 population).

The international Union against tuberculosis and Lung diseases, The World Health Organization (WHO), Nerwagian Heart and Lung disease (LHL), German Leprosy and TB relief Association (GLRA) and Federal Ministry of Health (FMOH) signed a contract for cooperation and financial and technical assistance for TB control in Sudan. The FMOH fully adopted the WHO's policy package for tuberculosis control, directly observed treatment, short-course (DOTS). The DOTS expansion was supported by training and intensive supervision. In year 2002 Sudan declared DOTS ALL OVER.

In 1999 Reference TB Laboratory initiation explored for quality assurance system.

In 2006 the detection rate, cure rate were reported to be 34% and 81% respectively¹².

The patients are now identified and treated using standard national treatment guidelines given in the National Manual.

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