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المكتب الاقليمي لشرق البحر الأبيض

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TECHNICAL DISCUSSIONS - SUB-COMMITTEE A

ANCYLOSTOMIASIS

INFORMATION FROM GOVERNMENTS

At the Eighth Session of the Regional Committee for the Eastern Mediterranean, Sub-Committee A decided on "Ancylostomiasis" as the subject for the Technical Discussions at its 1959 Session. Accordingly, on 30 March 1959, the Regional Director sent a circular letter to all Governments, asking them to provide detailed information regarding the disease in their countries, so that a comprehensive review might be prepared at the Regional Office to form a basis for the Discussions.

Aden, Cyprus, Jordan and French Somalia replied that ancylostomiasis did not exist as an endemic disease in their countries. The replies to the questionnaire* received from Ethiopia, Iran, Iraq, Israel, Lebanon, Pakistan, Sudan, Tunisia, and the Provinces of Egypt and Syria of the United Arab Republic, were as follows:

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* Replies from Somalia (Italian) and Tunisia appear in documents EM/RC9A/Tech.Disc./13 and EM/RC9A/Tech.Disc./14 respectively.

Question 1

Do you have any figures which evaluate the morbidity of the disease in different representative localities in your country (incidence and intensity of infestation, mentioning the species of hookworm) and the resulting work incapacity? Mention of the disease in relation to occupation (such as among miners) is also requested. A short summary of peculiar features of the clinical picture of the disease (such as ground itch) and the frequency of their incidence would be useful.

ETHIOPIA*

The incidence of hookworm is approximately: 6% in Addis Ababa, 19% in Gondar, 23% in Harrar, 55% in Naqamte and Jimma, 40% in Yrga Alem, 10% in Eritrea, 10% in Axum and 0% in Dessie.

Both ancylostomiasis doud and Necator are found in the country.

* The Health Authorities have indicated that they are not in a position to reply fully to the questionnaire. The information given under each item has been supplied by interested individuals on their own initiative.

IRAQ

There are no exact data about the distributional pattern of this disease throughout the country but Dr. Jamal El-Din, the Expert who was deputated by WHO to Iraq, has made a survey of the disease, and it was found that this disease prevails in the Southern and parts of the Central Regions of the country and does not exist in the North. Duedenale type of ancylostomiasis infection causes weakness, anaemia and pains in the abdomen with indolence.

ISRAEL

We have no figures which can give a representative picture of the prevalence of ancylostomiasis in Israel.

High prevalence is known to exist amongst Arabs in rural areas, and immigrants from India, Yemen, Iraq and Iran, who brought their infection with them.

Surveys of small communities of immigrants from Cochin showed prevalence of 28-40%.

The parasite is Ancylostoma duodenale

There is no data as to incapacity for work as a result of infection, and in any case, it would be extremely difficult to differentiate between the effects of ancylostomiasis, malnutrition and other parasite infections. There is no clear connexion between occupation and infection in the clinical cases, except to say that there is an association with agricultural work.

Clinical features show no special pattern and include: vague abdominal pain, constipation, diarrhoea and "weakness". Anaemia was not a necessary concomitant.

LEBANON

(1) The country was infected by foreign troops during the last World War.

(2) Infestation is mainly prevailing in the coastal area, where there are banana plantations.

(3) No reliable epidemiological survey has been carried out so far. However, among the persons suffering from intestinal parasitic diseases and having undergone stool examinations (nearly 15,000 examinations), the infection rate may approximately be estimated at 1%.

PAKISTAN

The morbidity of the disease according to a survey carried out in 1931 by the Health Department is given in the paper by Dr. Nazir Ahmad (Document EM/RC9A/Tech.Disc./9). The results of recent surveys in Lahore, Sialkot and Attock districts, are also given in that paper and in one by Dr. Ahmad and Dr. K.S. Shah (Document EM/RC9A/Tech.Disc./10). Investigations on hookworm disease in Attock district were carried out by Dr. K.S. Shah, in 1953. (Document EM/RC9A/Tech.Disc./11). Occupational incidence in various groups and detailed information on clinical features is also included. Ground itch has been noted in only 0.5 to 1.0% patients.

SUDAN

Ancylostomiasis spreads in the extreme south of the Sudan, mainly in Equatoria and Bahr El Ghazal Provinces where the rainfall is high and typical tropical climatic conditions exist.

The residents are farmers and live in isolated villages in the jungle.

The disease is symptomless and is only discovered during routine examination. It does not therefore cover any manifestation such as anaemias. The patient does not come for treatment of the disease, but it is treated when the reason of call is another complaint.

Total annual average number of cases, discovered in routine examination, in these infected areas is about 7000.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

The incidence of ancylostomiasis infection in representative localities is yearly illustrated in the statistics of the Endemic Diseases Hospitals. There are 126 such units scattered all over the country, the total number of persons examined during the year 1959 was 1,128,465, and the percentage of hookworm infection in the different localities is shown in document EM/RC9A/Tech.Disc./2, page 23.

The mean percentage of infection in all inhabitants is 12.2%. The work incapacity resulting from ancylostoma infection could not be separately estimated in our patients. The reason is the concomitant parasitic infection is mainly bilharziasis.

The greatest majority of victims of the disease are farm labourers.

Peculiar clinical features of the disease in Egyptians:

(1) Pale yellow colouration of the skin.
(2) Anaemia with bouts of fever.
(3) Simulation to gastric or duodenal ulcer.
(4) Simulation to nephrosis.
(5) Endemic parotitis.
(6) Some manifestations of the larval stage, particularly ground itch and irregular fever are not marked symptoms in our patients. Asthmatic bronchitis with copious sputum is, however, common in chronic cases subjected to repeated infections.

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

Ancylostomiasis is confined to two districts of the Syrian Province: Deir El Zor district and Hama district.

Deir El Zor District

Ancylostomiasis is widely spread on the banks of the Euphrates and in the villages scattered eastwards on a stretch of 120 kilometres in length, from the Euphrates to the district of Abu Kamal. The disease is severely prevailent with a morbidity rate of 50% in most of the villages and even 80-100% in some others, according to Professor Nagati's statistics for 1956, and also to several other statistics.

Hama District

Here, the disease prevails in the villages bordering on the Orontes, in the neighbourhood of Hama, with an incidence rate of 70-97%, according to Professor Nagati's statistics for 1956.

Agricultural and commercial relations as well as marriages between the Syrian and Iraqi populations are the sources of transmission of the disease from the infected Iraqi villages to the Syrian villages. The same applies to the relations existing between the districts of Hama and Deir El Zor: labourers in the cotton plantations of Deir El Zor transmitted the disease to Hama.

Agriculture is the profession which was originally responsible for the spread of the disease. It is a fact that through the agricultural workers, who go barefooted, faeces are spread all over some favourable ground - which contributes to maintaining the disease in some areas such as the districts of Deir El Zor and Hama.

The type of ancylostomiasis prevailing in Syria is the duodenal ancylostomiasis. There are no traces of the other type, the "Necator American".

IRAN

Hookworm disease exists in the Caspian Region from Astara (North-west corner of the Caspian coastal area) until Gorgan area on the east side of the Caspian Sea. The infection rates vary from 0 to 90% in the rural areas with following specific aspects: It is between 0-10% in the organized towns and cities of the area mainly in the outskirts; the rate is specifically high among agricultural workers in the rice fields (85% of cases) and finally the frequency and intensity of infection is greatest in the Guilan, Mazandaran provinces and it fades away in the Gorgan area. (See table, Annex II). The infection is also recorded from Abadan area, Kachan Babak (Yazd) and Sarakhs but further study is necessary for confirmation and clarification.

Both ancylostoma duodenale and Necator americanus are found in the Caspian Region, and in many instances as a mixed infection. Other parasitic infections such as ascariasis, trichocephalosis, and taeniasis, as well as some intestinal Protozoan infections are also found.

Age Distribution

Although few cases among children of about one year of age have been found by local examination, as well as in 60-70 old persons, the infection rate is highest among the age group 10-20.

Particular clinical aspects of ancylostomiasis in the Caspian Region are given below; this data are collected among 181 patients who had referred to the Rasht General Hospital in 1951 for general illnesses and were found infected with hookworm after laboratory examination.

Number of patients		181
	Male	132
	Female	49
Infections:	Hookworm	100%
	Ascaris	26%
	Trichiuris	25%
	Taenia	2%
	E.coli (kyste)	2%
Symptoms:	They suffer from following symptoms:	
	Anaemia	45%
	Epigastric pain	28%
	Fever	27%
	Oedema of lower extremities and malleolus	26%
	Neurasthenia, Myasthenia	15%
	General fatigue	15%
	Vertigo	10%
	Palpitation	9.3%
	Pain in various parts of the body	9.3%
	Sulicterus	8.3%
	Cachexia	8%
	Ascitus	6%
	Diarrhoea	5%
	Oedema of the face	5%
	Dyspnea	3.5%
	Anorexia	35%
	Epistaxis	2.7%
	Splenomegalia	2.7%
	Bourdonnment	2%
	Constipation	1.6%
	Vomiting	1.6%

Since 1957, i.e. after the interruption of malaria transmission by active malaria control and eradication activities, nookworm could be rated as the public health problem No.1 in the Caspian Region. The resulting work incapacity is not known.

Question 2

Which services of your Ministry are responsible for directing the control of the disease; what is the total amount of their budgets, and the number of their personnel? Is any national epidemiological survey team working in your country?

ETHIOPIA

The treatment and control of the disease is part of the overall health programme. Therefore it is tackled in hospitals and clinics. No special department for epidemiological survey exists at present. However, the Gondar teams are instructed to tackle the problem in the Health Centres whenever these centres are available.

IRAQ

There is no special section in the Endemic Diseases Institute to carry on such services in Baghdad.

ISRAEL

Control activities are part of the normal epidemiological and environmental sanitation services of District Health Offices; there is no special budget and no national survey team.

PAKISTAN

West Pakistan Provincial Health Directorate is responsible for directing the control of the disease. Three teams each comprised of a doctor, a dispenser, a sanitary inspector, a peon, a driver and a sweeper are working in the field besides the microscopist in the laboratory and Ministerial staff in the office. This staff works under the supervision of the Provincial Epidemiologist. The annual budget is about Rs.50,000.

SUDAN

The disease, as recorded above, is treated in general hospitals and dispensaries. There is no special section for its control, nor is there any budget appropriated for it. The general Public Health measures for the environmental conditions control are applied.

No special survey were carried out.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

There are no services in the Ministry of Public Health whose work is only devoted to the control of ancylostomiasis. Therefore it is not possible to calculate a certain budget which represents the actual annual expenditures in

this respect. The control of hookworm infection is a principal objective in the control of endemic diseases in general.

The following services are responsible for the control of endemic diseases in the Ministry of Public Health:

Section	No. of Units	Personnel		Total Budget
1. Mass Treatment and Control Units	168	Doctors	172	L.E. 361,890
		Sanitary Engineers	3	
		Clerks	175	
		Lab.assistants	168	
		Nurses	168	
		Labourers	1370	
2. Endemic Diseases Hospitals	126	Doctors	115	L.E. 245,170
		Clerks	78	
		Lab.assistants	378	
		Nurses	103	
		Labourers	1331	
3. Rural Health Units	248	Doctors	258	L.E. 761,400
		Clerks	317	
		Lab.assistants	247	
		Sanitary supervisor		
		Midwives and Nurses	772	
		Labourers	3388	

L.E.1,368,460

The field control of Schistosomiasis is not included in the services of the Endemic Diseases Hospitals or the Rural Health Units. This control work is done by a special section in the Department of Endemic Diseases and there is a special budget for this purpose. The Mass Treatment and Control Units, however, are responsible for this field control in Sharkyiah and Minya provinces only.

There is no national epidemiological survey team working in our country.

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

A national team is assigned for work in each of the districts of Deir El Zor and Hama. These teams belong to the Department of Endemic Diseases Control which is attached to the Directorate of Health Services at the Ministry. Each of these two teams carries out the survey, observations and treatment and as well as laboratory examinations, control, propaganda, health guidance including of course health promotion. Each team is supervised by a doctor assisted by personnel having already acquired a practical knowledge of ancylostomiasis control work.

The reports received from the Ministry confirm that the work is progressing in accordance with the technical and scientific programme devised. The results achieved may be evaluated later.

The total amount of the funds allocated to these teams reaches 6,900 Syrian pounds for each team.

IRAN

Although no specific project exists for study and control of hookworm in Iran, it has been dealt with much attention by the respective organizations.

The departments of public health and environmental sanitation and medical care of the Ministry of Health have been active as a part of a general programme for the improvement of health conditions in the Caspian Region, to deal with the installation of toilets and disposal of faecal materials as well as health education and treatment of cases; however, this activity has a spotty aspect, and mainly within the reach of Health Units and Dispensaries and covers all parasitic diseases.

It might be estimated that about 1,500,000 Rials is spent each year on hookworm. Two sanitary engineers and eighteen sanitarians, two health educators are involved in sanitation activities in the Caspian Region.

The Institute of Parasitology and Malariology has conducted surveys since 1951 in different parts of the country as a part of the general health survey and has obtained valuable information about incidence and some aspects of epidemiology of the disease; the prevalence of A. duodenale and N. americanus, etc.

Question 3

Has any research work already been conducted in your country on ancylostomiasis? Is there any research work being carried out at the present time?

ETHIOPIA

No research work in this field has ever been conducted nor is being conducted.

IRAQ

No research work has been conducted in our country on ancylostomiasis, except surveys of Bilharzia, Ancylostomiasis and Ascaris which were carried out by the International Bilharzia Project of the Endemic Diseases in Mussayab El-Kabir Project area.

ISRAEL

Other than the surveys mentioned above, there has been no research work done in the field. We are commencing a field trial of "Bephenium Hydroxynaphtholate".

PAKISTAN

A hookworm infection survey was carried out recently in Lahore Corporation Villages under the auspices of Pakistan Medical Research Council. The details are given in the paper by Dr. Ahmad and Dr. Shah (Document EM/RC9A/Tech.Disc./10) which is being published in the Pakistan Journal of Medical Research. At present research is in progress on:

(1) Clinical trial with "alcopar" in the treatment of ancylostomiasis.

(2) Relative frequency of infection with Necator americanus and ancylostoma duodenalis.

(3) How frequent is infection through oral route?

SUDAN

Nil.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

A considerable amount of research work has been conducted in our country. For Technical Reports see Annex I.

Research being carried out at present in the Institute of Research of Tropical Medicine is as follows:

(1) Estimation of the blood volume in both ancylostoma anaemia and ancylostoma infestation. A comparative study between blood volume of normals

and that in ancylostomiasis on the one hand, and the effect of other associated parasitic infestation on the other hand.

(2) A similar study on the apparent half-survival time of Cr^{51}-tagged erythrocytes in ancylostomiasis.

(3) A statistical study on the effect of ancylostoma infestation on haemoglobin level in comparison with negative controls and other parasitic infestations.

(4) A similar statistical study regarding the total and the differential white cell counts.

(5) Studies on thorn test and its effect on eosinophilia due to ancylostoma infestation.

(6) The study of any possible relation between the degree of anaemia in ancylostoma and the worm load approximately estimated by the standard Stoll's technique.

(7) A comparative study concerning the efficacy of the different anthelmintics used in the treatment of ancylostoma.

(8) Evaluation of the anthelmintic efficiency of some new drugs in ancylostomiasis.

(9) Is de-worming necessary in ancylostoma infestation versus ancylostoma disease? and what is its significance?

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

Research work on ancylostomiasis in the Province of Syria was undertaken in 1956 by Professor H. Nagati. The two teams at present at work also carry out research work and undertake the necessary studies in their respective fields.

IRAN

Special studies are now conducted in the determination of distribution of A. duodenale and N. americanus and their relationships to each other and clinical course agencies, as well as general clinical and therapeutic studies.

Question 4

Do you have any estimate of the relationship of ancylostomiasis to nutrition, to anaemia and to the level of intelligence of school children?

ETHIOPIA

The haemoglobin level in highly endemic areas as, for example, Jimma compared with an area free from hookworm, like Dessie, shows no marked difference.

IRAQ

We believe that this disease causes anaemia and general weakness and affects the intelligence of the school children and mostly among the peasants in the villages and rural areas.

ISRAEL

No.

PAKISTAN

Relation of ancylostomiasis to anaemia. This investigation is being carried out under the auspices of West Pakistan Medical Research Council at Fatimah Jinnah Medical College for Women, Lahore.

SUDAN

No.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

The relation of ancylostoma infection to anaemia is quite definite in mass surveys, although multiple parasitic infection in the inhabitants vitiate the data obtained to a great extent. In the survey carried out in Sharkyiah province in 1957, out of 2578 patients suffering from severe anaemia (Hb level 50% or less), 1100 were localized in the area of Abu Hammad which showed the highest percentage of ancylostoma infection in the province.

The effect of malnutrition on the incidence and intensity of the infection is very striking in some localities in our country. In such areas it appears that the general level of the infection is dependent as much on the nutritional state as it is on the degree of exposure to infection. (See Document EM/RC9A/Tech.Disc./2, page 13).

Pellagra in Egypt is six times as common in ancylostoma patients as in the general population. This implies that malnutrition which leads to pellagra is also conducive to severe ancylostoma infection.

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

As the disease is limited to a certain part of the two districts of Deir El Zor and Hama, there are still no estimated data in respect of the relationship between ancylostomiasis and nutrition, anaemia and the level of intelligence of school children.

IRAN

Although the highest incidence is found among under-nourished persons and that only 15% of microscopically found cases did not show any anaemia, and that few under-developed children have been found among patients and villagers, no specific estimate of the magnitude of the problem could be given at the present time.

It should be mentioned that the measurement of level of intelligence of school children is pending the development of a special test suitable for Iranian children. European and American tests have been tried by the Institute of Parasitology and Malariology without success.

Question 5

What medicaments are preferred in use against ancylostomiasis in your country? What are the types, costs and approximate quantity used per annum? Have mass treatment campaigns been conducted? If so where and when? What drugs were used and at what cost?

ETHIOPIA

Oil of chenopodium, tetrachloretevlene,carbon tetrachloride, ascaridol.

IRAQ

Most of the hospitals and dispensaries use tetrachloretheylene against this disease. Mass treatment campaigns have not been conducted.

ISRAEL

The following medicaments are in use: Tetrachlorethylene, Hexylresorcinol and oil of chenopodium. There have been no mass treatment campaigns and we have no estimates as to the quantities and cost of the drugs used.

PAKISTAN

Tetrachlorethylene has almost always been used for the last thirty years. Mass treatments have been carried out in a few districts of the former province of Punjab. Approximately 40 lbs. of tetrachlorethylene are used annually.

SUDAN

Thymol is used. Annual cost is above LS.500.

Mass treatment was not carried out in the past.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

Since 1921 many drugs have been used for the treatment of ancylostoma infection in our country. Experience has proved that the drug of choice is carbon tetra-chloride which is on current use in all anthelminthic units. (See: Document EM/RC9A/Tech.Disc./2, pages 19 and 20).

Patients who are clinically unfit for carbon tetrachloride treatment are given oil of chenopodium.

Statistical studies have shown that the treatment of a single patient infected with ancylostoma costs about 14 piastres. This figure represents the share with total expenditure including staff salaries, drugs. etc. The amount of tetra-chloride needed for use in all anthelminthic units for the fiscal year 1958-1959 is estimated to be 2311 kgms. which cost about 550 Egyptian Pounds.

Mass treatment campaigns started in Sharkiyah province in 1955, in Minya province in 1956, and in Damietta province in 1958. This kind of work will extend all over the country in within ten years as a programme for mass treatment and control of endemic diseases. Carbon tetra-chloride is also used for treatment in such campaigns to be replaced by oil of chenopodium or hexyl-resorcinol if its use is contra-indicated as mentioned before. The cost of treatment is nearly the same as calculated in anthelminthic units.

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

The drugs used are tetrachloro-ethylene, carbon tetrachloride, hecto-neurostol and other preparations. The treatment is repeated after a certain time, as patients seldom get rid of all worms after a single treatment. The annual cost of drugs amounts to 3,000 Syrian Pounds for the two districts. No mass treatment campaign has yet been conducted.

IRAN

Hexyl resorcinol and essence of chenopodium have the widest use now in Iran. The cost of one treatment for adults is about 90-120 rials. In a few instances other drugs such as thymol have been used without success. No mass treatment campaign is conducted yet in Iran.

At present Bephenium hydroxynaphthoate (alcopar of Wellcome Laboratories of Tropical Medicine) is under experiment by the Institute of Parasitology and has given the most satisfactory results, since it could be used readily for treatment of ordinary cases as well as cases with other hepatic, anaemic complications, etc.

It is probably the best drug available now for mass campaigns.

Question 6

Is control work, such as environmental sanitation (construction of latrines, etc.) being carried out? Please describe such campaigns if any exist or have existed in your country, and their effect on the incidence and intensity of infection.

ETHIOPIA

As part of the functions of the Gondar graduate health team instructions for construction of simple latrines with local materials are given to as many interested individuals or groups in the community wherever these teams exist.

IRAQ

No environmental sanitation projects and public latrines have been constructed to control this disease in Iraq.

ISRAEL

Environmental sanitation control is carried out as a routine measure. There have been no campaigns and no evaluation is possible.

PAKISTAN

Bored-hole latrines were introduced in endemic areas but they did not prove successful (Poster - Appendix IV).

SUDAN

Latrines were erected in certain infected areas and shoes were tried but such measures failed owing to the climatic and occupational condition of the areas and the people.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

Control work in the field of hookworm infection is carried out by the Department of Rural Hygiene. Until December 1958, 32,393 bore-hole latrines and 2,551 septic tank latrines have been constructed in seventy villages in Giza, Kaliobyiah, Menofyiah, Dakahlyiaha and Minya provinces. In addition the mass treatment and control section has actually begun to construct latrines in the houses of different villages in Sharkyiah. The budget of this section includes a sum of L.E.16,800 to be spent yearly for this purpose.

The Ministry of Public Health in cooperation with the International Health Board of the Rockefeller Foundation has installed certain sanitary improvements including latrine construction in Qalyub area. This work has been done in connexion with study of health conditions in Egyptian villages carried out in 1952 by the Research Institute in collaboration with late Professor Asa C. Chandler. (J. Egypt. Med. Assoc. Vol.36, 1953).

It is quite apparent that hookworm infections were found to be much more prevalent in the insanitated than in the sanitated village. Although infection occurred in both villages, yet their much greater frequency in the insanitated village indicates a beneficial effect of the sanitary improvements within a period of two years.

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

Our basic work in respect of ancylostomiasis control is: to induce agriculturists to build latrines, to teach them how to use these latrines, and to show them that by doing so they prevent the disease.

IRAN

During the last eight years about 15,000 latrine slabs have been built and distributed among villagers in the Caspian Region by the Environmental Sanitation Division of the Ministry of Health. The villagers have to pay the cost of materials used and help in the construction of the latrines. However, as mentioned before, the effort is incomplete in terms of total coverage of totality of houses in one village or all villages of the area.

No study has been conducted as yet for elucidation of effect of the said activity in lowering the incidence of hookworm.

Question 7

To what extent has health education been used among the public as a measure to avoid infection?

ETHIOPIA

Health education on the impact of ancylostomiasis on the health of the population has not been carried out separately or given special emphasis. However, whenever the health worker teams attempt to impart information on personal and environmental hygiene, the result has been encouraging and rewarding.

IRAQ

We believe that health education is one of the factors to avoid infection but unfortunately it was not used actively in Iraq.

ISRAEL

Health education is widely used but not specifically against ancylostomiasis.

PAKISTAN

The anti-hookworm campaign teams described above under Question 2 carry out health education programmes in the villages, apprising the people of mode of infection, nature of disease, extent of ill effects and the methods of prevention. This programme is carried out through distribution of literature in local languages, and through group talks and lectures.

SUDAN

Ineffective.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

The Section of Health Education in the Ministry of Public Health devotes most of its work to the combat of endemic diseases in the country, particularly to schistosomiasis and hookworm diseases. Its services in this respect include:

(1) Pamphlets and coloured maps. Such maps are presented to out-patients in hospitals, in schools, clubs, government offices and in similar places to attract the attention of the largest possible number of the inhabitants.

(2) Cinematographic films.

(3) Special lectures are given in mosques every week where the people of the village gather for Friday prayers. Similar lectures are delivered by trained employees of the Health Education Section in special meetings arranged for this purpose in schools, clubs, out-patients and maternity centres.

(4) In each village, the cultural education specialists try to form a special organization where members are school boys and girls, who are instructed to take care of all health problems inside the school and also in the village if possible. In addition, the inhabitants of each village are encouraged in every way to form similar organizations.

(5) The Cultural Education Section is trying to form special health museums in different parts of the country. Inhabitants and school boys are encouraged to pay regular visits to these museums where lectures dealing with health problems of endemic diseases are regularly delivered.

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

Health education is resorted to through school teachers, mosque imams, health pamphlets, colour illustrations, movie films and lantern-slides, as well as through lectures given by specialists, before starting control activities in a given area.

IRAN

Health education of the public is conducted by the Division of Health Education of the Ministry of Health by producing pamphlets, posters, film strips or projection of films, as well as contact with people.

These activities have a general health education scope, and cover hookworm as well. It is thus difficult to give an estimate of specific activities conducted for ancylostomiasis.

Question 8

What are the laws or regulations, promulgated or decreed, for the control of the disease or its prevention? Is it possible to express an opinion on the facilities and ease of enforcement and on the efficacy of these laws or regulations?

ETHIOPIA

No law does exist at present. However, ancylostomiasis is included in the weekly epidemiological reports requested from all hospitals and clinics.

IRAQ

There are no laws and regulations in Iraq, for the control of this disease.

ISRAEL

The only legal requirement is that of compulsory notification.

PAKISTAN

There are no laws or regulations on this subject. It is difficult to enforce regulations because of poor economic conditions.

SUDAN

There are laws and local orders on pollution of waters but they are not effective in these areas and not enforced.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

There are no special laws or regulations, promulgated or decreed, for the control of hookworm disease or for its prevention. Such a law would not be easily enforced as it would naturally compel the inhabitants to undertake certain measures which entail a financial burden as, for example, construction of latrines, or wearing a form of foot-wear. There is, however, a special law for the compulsory treatment of patients suffering from bilharziasis; advantage is taken to treat the patient for other parasitic infections, including ancylostomiasis at the same time.

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

A Decision of the Governor of Deir El Zor issued under No.578 on 9 November 1959 and which has become operative in the infected zones, mainly deals with latrines, bare feet, distribution of health pamphlets, use of all health education media, and safe water supply by providing villages with pumps.

IRAN

A law, covering all aspects of environmental sanitation, is under hearing in the Houses of Parliament and Senate.

Question 9

What are the present plans for major development or constructional projects which could be expected to affect the extent or prevalence of ancylostomiasis? How is the prevention of the disease included in such plans?

ETHIOPIA

It is being realized more and more that public health (inclusive ancylostomiasis control) must be included in all development programmes, especially in the agricultural, construction of new dams, irrigation projects, etc.

IRAQ

No preventive plans have been drawn with relation to the major development and constructional projects.

ISRAEL

None.

PAKISTAN

In the next five-year plan, provision exists for improvement of sanitation in urban as well as rural areas which indirectly is expected to effect reduction in disease incidence.

SUDAN

Nil.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

There are three major constructional projects which are expected to increase the area of cultivated land in our country, the High Dam, the Tahrir Province and the New Valley. Special committees are studying the effect of such developments on the extent or prevalence of endemic diseases in order to advocate the necessary measures to be undertaken for the control and prevention of such hazards.

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

The present plans aiming at the expansion of the control of the disease cover all aspects of the work, whether preventive or curative, as well as the activities connected with propaganda, health education, building and use of latrines, use of shoes, drinking water supply through pumps, etc.

IRAN

The Sefid rud Dam project will affect seriously the incidence of ancylostomiasis in Guilan (West Caspian) area by provision of regular flow of water for irrigation, development of agricultural practices, creation of new settlements and movement of population from infected area to the organized agricultural development area. The area is supposed to be taken over by the community development programme covering all aspects of health, education, industry, agriculture, etc. However, no specific plan is yet made for hookworm diseases.

Question 10

What is the effect of ancylostomiasis on the output of work? What industrial projects in particular are affected by the prevalence of ancylostomiasis among labourers?

ETHIOPIA

No information available.

IRAQ

This disease affects the output of the work of peasants and it has no affect on the industrial work.

ISRAEL

Not known, probably negligible.

PAKISTAN

This information is not available.

SUDAN

Not measured: No projects are planned thereat.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

It is almost impossible to estimate the work incapacity resulting from ancylostoma infection alone. The reason is that most patients harbour more than one parasite each of which especially bilharziasis, may play a part in reducing the capacity for work.

The greatest majority of the inhabitants infected with ancylostomiasis in our country are agricultural field labourers. The work capacity of such infected labourers has been estimated to be reduced by 35% in comparison with healthy labourers. As a result of this reduction the yearly economic loss amounts to 80 million pounds.

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The output decreases in the proportion of 50% among sick people and the land yield is therefore substantially affected. If the disease did not exist, the time and money devoted to this control could have been directed towards another goal.

IRAN

Hookworm affects mostly the rice cultivation activity. 85% of infected cases are agricultural people mostly involved in rice culture.

Question 11

Has any action been taken for coordinating the work of economic development projects in your country with the prevention of ancylostomiasis?

ETHIOPIA

No.

IRAQ

No action has been taken for coordinating the work of economic development projects in our country with the prevention of ancylostomiasis.

ISRAEL

No need.

PAKISTAN

No special project has been undertaken.

SUDAN

No.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

The economic development projects in our country are expected to raise the living standard of the population. Such measures, as better wages, better food and hygienic housing for the labourers would naturally be effective in the prevention and control of ancylostomiasis. Such coordination of work and study is undertaken by specialists in 250 Rural Combined Units and 200 Rural Social Centres scattered all over the country.

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Studies are under way to reach this objective.

IRAN

No specific action is taken yet for coordination of work of economic development projects with the prevention of ancylostomiasis.

Question 12

What institutions are now carrying on programmes of research on ancylostomiasis problems, including chemotherapy?

ETHIOPIA

Research on ancylostomiasis will be included in the research programme of the new epidemiologist to be attached to Institut Pasteur d'Ethiopie.

IRAQ

There are no institutes to carry on such programmes in Iraq.

ISRAEL

Division of Epidemiology, Ministry of Health, Jerusalem.

PAKISTAN

(1) Institute of Hygiene and Preventive Medicine, Lahore, West Pakistan and

(2) Fatima Jinnah Medical College, Lahore, West Pakistan

under the auspices of West Pakistan Medical Research Council.

SUDAN

Nil.

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Research on ancylostomiasis problem is carried out by the Institute of Research for Tropical Diseases and by the Tropical Diseases Section of the Faculty of Medicine in Cairo University

IRAN

The Department of Helminthology of the Institute of Parasitology and Malariology is conducting at present studies on the epidemiological, clinical, and therapeutic aspects of hookworm. At present a clinical centre at Firouzabadi Hospital, a station at Tchalus and the Helminthology Laboratory at the Institute's headquarters are contributing to these studies.

Question 13

What ancylostomiasis control projects are envisaged for the future?

ETHIOPIA

Control to be integrated in the basic health services (Health Centres).

IRAQ

It is hoped to establish ancylostomiasis section in the Endemic Diseases Institute in Baghdad to control this disease.

ISRAEL

We would like to attempt ancylostoma eradication in a village as a basis for further work.

PAKISTAN

The control project described under Question 2 above will be continued in the next years. Provision for this has been made in the next five-year plan period.

SUDAN

No plans exist at present.

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Control projects envisaged for the future:

(1) The installation of Mass Treatment and Control Units all over the country within ten years. This project also provides for the construction of model latrines in the houses of the villages. The aim is that the inhabitants will follow these models themselves. Since they will be convinced by the hazards of promiscuous defaecation. Moreover, the costs of construction of such latrines are very cheap.

(2) Coordination of work between the different medical units which combat endemic diseases, so that each person will have the chance to be treated and educated as regards the grave sequelae of these infections.

(3) New village planning on hygienic basis is now being carried out by the responsible authorities.

(4) Different sanitary engineering projects will be carried out in a conjoint programme by the Ministry of Public Health and the Ministry of Municipal and Rural Affairs.

PROVINCE OF SYRIA, UNITED ARAB REPUBLIC

The projects envisaged for the future aim at the implementation of the present programmes, by turning to the best account any kind of possible improvements, as a result of expert scientific and technical studies.

IRAN

The control of ancylostomiasis is included in the general programme of health development of the Ministry of Health. The Ministry of Health wishes to organize a pilot project for control of ancylostomiasis in an infested area, where by all efforts of environmental sanitation, health education, mass treatment, as well as development of industry, promotion of level of education, improvement of agricultural practices and community organizations will be co-ordinated for the benefit of the people. Prior to the start of this project, an evaluation of all health problems and their reflexion on work out-put and working potentialities, mental development, economic level of the people, etc. will be performed and after the start of the project, the progress of work and improvements will be audited regularly.

Experience gained at this pilot project will be used for planning of an overall programme for the infested areas. At the same time the pilot project will be used as a centre for training and orientation of all categories of personnel necessary for the expanded programme.

Question 14

What type of assistance would your Government wish to obtain from international or non-governmental organizations?

ETHIOPIA

At present only further support to the Gondar training programme and the establishment of health centres foreseen.

IRAQ

The type of assistance required from international or non-governmental organizations will be considered upon the establishing of ancylostomiasis control section in the Endemic Diseases Institute.

ISRAEL

Technical advice only at this stage.

PAKISTAN

Ancylostomiasis control project could be extended to at least six more districts in West Pakistan where disease is endemically present, if transport facilities were available. Six jeeps if supplied by an international organization would be of great assistance in extending the control programme.

SUDAN

Not at present.

PROVINCE OF EGYPT, UNITED ARAB REPUBLIC

Assistance needed from international organization may be in the form of a pilot project conducted in a fairly large area of about 500 sq. kilometres and 250,000 inhabitants, in order to evaluate the collected data on a more accurate basis, and to find out the best and less expensive methods of combating such infection through improvement of environmental sanitation.

Such organizations can participate by supplying:

(1) An expert in nutrition.

(2) Expert in immunological studies.

(3) Sanitary engineer

(4) Supplies and equipment to carry on the various research problems that may arise during the work.

(5) The necessary means of transport for carrying on such investigations.

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Assistance from WHO in setting up an ancylostomiasis centre similar to the centres established in the Syrian Province for the control of certain endemic diseases.

IRAN

For the execution of the above mentioned pilot project, the Ministry of Health needs the technical and financial assistance of WHO, FAO, UNESCO, ECOSOC, UNICEF and other international organizations.

For the planning of this project and evaluation of needs, the Government requests the services of a short-term consultant with experience in community development, sociology and epidemiology, for two months.

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ANNEX II

Summary of Survey Data on Hookworm in Iran 1951-1958

No.	Shahristan and cities	Total No. Villages	Total population	Villages Surveyed		Persons Examined			Proportion of Inhabitants examined	
				No.	Total population	No.	+ Hookworm	% +	In Surveyed Villages	In Shahristan
1	Pahlavidej town	-	-	1	1000	35	0	0	3,5	-
2	Gorgan Shah	323	155200	20	19400	2143	224	10.45	11.0	1.38
3	Gorgan City	-	-	1	25000	1602	95	5.93	6,4	-
4	Babol Sh.	285	166800	18	17475	2120	1337	63.00	12.13	1.27
5	Babol City	-	-	1	39096	1653	264	15.77	4.22	-
6	Sari Sh.	577	246400	7	7100	868	496	57.14	12.14	0.32
7	Sari City	-	-	1	25000	919	150	16,3	3,67	-
8	Amol Sh.	527	143900	2	1030	135	86	63.7	13,10	0,09
9	Shahi Sh.	353	166300	3	5220	99	42	42,42	1,89	0.05
10	Shahsawar Sh.	322	72000	2	6940	164	103	62,80	2.36	0.22
11	Lahijan Sh.	-	270000	2	23000	200	35	17.5	0,86	0.07
12	Bandar Pahlavi City	-	-	1	25000	250	31	12.4	1.0	-
13	Rasht Sh.	442	396000	2	2240	127	67	52.75	5,66	0.03
14	Rasht City	-	-	1	120000	249	35	14,0	0.2	-
15	Foumen Sh.	227	155000	2	9014	106	44	41,5	1.17	0.06
16	Tawalesh Sh.	155	78000	2	2300	415	194	46,74	18.04	0.53
17	Astara City	-	-	1	8190	128	72	56.25	1.56	-
					337065	11213	3275	29.20	3.32	