

World Health Organization
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No. 7

**EXPERT COMMITTEE ON
TUBERCULOSIS**

Report on the Fourth Session

Copenhagen, 26-30 July 1949

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WORLD HEALTH ORGANIZATION

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GENEVA

APRIL 1950

EXPERT COMMITTEE ON TUBERCULOSIS

Fourth Session

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- Dr J. I. Baldó, Chief, Tuberculosis Division, Ministry of Health and Social Welfare, Caracas, Venezuela
- Dr P. V. Benjamin, Tuberculosis Adviser, Directorate General of Health Services, New Delhi, India
- Dr E. Bernard, Professeur à la Faculté de Médecine de l'Université de Paris, France (*Vice-Chairman*)
- Dr I. Gonda, Chief, Tuberculosis Control Division, Department of Public Health for Slovakia, Bratislava, Czechoslovakia (Member of the Tuberculin Testing and BCG Vaccination Panel, WHO)
- Dr P. M. D'Arcy Hart, Director, Tuberculosis Research Unit, National Institute for Medical Research (Medical Research Council), London, United Kingdom (*Rapporteur*)
- Dr H. E. Hilleboe, Commissioner of Health, New York State Department of Health, Albany, N.Y., USA
- Dr J. H. Holm, Chief, Tuberculosis Division, State Serum Institute, Copenhagen, Denmark (*Chairman*)

Co-opted Members :

- Dr J. Bretey, Chef du Service de la Tuberculose à l'Institut Pasteur, Paris, France (Member of the Tuberculin Testing and BCG Vaccination Panel, WHO)
- Dr F. R. G. Heaf, Adviser in Tuberculosis, Ministry of Health (England and Wales) and Department of Health for Scotland, London, United Kingdom (Member of the Tuberculin Testing and BCG Vaccination Panel, WHO)

Secretary :

- Dr J. B. McDougall, Chief, Tuberculosis Section, WHO

The report on the fourth session of this committee was originally issued in mimeographed form as document WHO/TBC/15, 15 August 1949.

COMMENTS BY THE EXECUTIVE BOARD

The Executive Board commented favourably on the report on the fourth session of the Expert Committee on Tuberculosis. The Annex to the report — “Plan for control programmes: suggestions for the control of tuberculosis in countries with undeveloped and underdeveloped programmes” — was specially welcomed; it was strongly suggested that health administrations should give the widest publicity to this document.

Attention was drawn to section 2 of the report “Training of personnel in tuberculosis control”, where it was felt that some confusion might arise with regard to the first sentence, which was intended to imply that the main difficulty in the creation of an antituberculosis organization is the lack of trained personnel.

The Executive Board emphasized the view that BCG vaccination can be fully effective only if it is carried out as part of a general programme of tuberculosis control, and it welcomed the comments made concerning mass radiography. The Board stressed the principle that mass-radiological examination should be undertaken only when collateral facilities exist for following up cases discovered during x-ray surveys.

The Board welcomed the attention which had been given by the committee to the advisability of providing inexpensive buildings for the accommodation of tuberculous patients in countries where the need of beds is urgent and where, for various reasons, the erection of more permanent structures is not possible.

EXPERT COMMITTEE ON TUBERCULOSIS

Report on the Fourth Session¹

The Expert Committee on Tuberculosis held its fourth session (first session of enlarged committee) at the Danish Red Cross College, Copenhagen, from 26 to 30 July 1949.

Dr J. H. Holm was elected chairman and Dr E. Bernard vice-chairman. Dr P. M. D'Arcy Hart was appointed rapporteur.

1. Consideration of Matters Referred by the Executive Board and the World Health Assembly

The Executive Board, at its third session, requested that the report on the third session of the ad hoc Expert Committee on Tuberculosis,² together with the comments of the Executive Board at its third session,³ should be referred to the new Expert Committee on Tuberculosis. The Second World Health Assembly agreed that this procedure should be adopted.⁴

¹ The Executive Board, at its fifth session, adopted the following resolution:

The Executive Board

(1) NOTES the report of the Expert Committee on Tuberculosis on its fourth session; and

(2) AUTHORIZES its publication;

Taking into account the recommendations of the expert committee in considering relevant items on its agenda,

(3) TRANSMITS the present report to the Third World Health Assembly; and

(4) POINTS OUT that recommendations of expert committees which concern WHO policy and operations remain recommendations unless and until they are implemented by the Executive Board or the World Health Assembly in adopting and putting into action the annual programme of WHO.

² *Off. Rec. World Hlth Org.* 15, 5

³ *Off. Rec. World Hlth Org.* 17, 11

⁴ *Off. Rec. World Hlth Org.* 21, 24

The committee accordingly reconsidered this document.

(i) After reconsideration, the Annex " Plan for control programmes : suggestions for the control of tuberculosis in countries with undeveloped and underdeveloped programmes " was revised, and appears as Annex 1 to the present report.

(ii) The committee agreed with the view expressed at the meeting of the Executive Board that WHO should give publicity to schools of thought rather than to views of individuals. It, therefore, recommends that the special reports envisaged under the heading of Circulation of Specialist Literature ⁵ might best be published under the names of their authors, e.g., in the *Bulletin of the World Health Organization*, but without WHO taking responsibility for their contents.

(iii) As to the criticism that it was unlikely that centres could be found with facilities for training Fellows in all the five fields of administration, epidemiology, laboratory and clinical work, and public-health nursing, the committee considered that such centres do exist. This matter is discussed further in Annex 1.

(iv) Apart from the above, the committee re-endorsed the report on the third session.

In view of the discussion at the Second World Health Assembly,⁶ the committee also gave further consideration to the question of tuberculosis officers to be attached to regional offices, and re-emphasized the view that there should be on the staff of WHO an adviser on tuberculosis available for each region.

2. Training of Personnel in Tuberculosis Control

The main reason for the deficiencies in tuberculosis control in many countries is a lack of trained personnel, which makes the development of programmes in this field extremely difficult, even with the best intentions of the governments concerned. The committee feels that here is one of the greatest needs that WHO can help to satisfy. The committee, therefore, recommends that WHO should assist in setting up permanent centres for training basic personnel in all branches of tuberculosis work, such as doctors, nurses, laboratory and x-ray technicians. So far as practicable, all these specialities should be catered for in the same area, which should, therefore, possess a dispensary, a laboratory, an epidemiological division

⁵ *Off. Rec. World Hlth Org.* 15, 7

⁶ *Off. Rec. World Hlth Org.* 21, 198

with mobile x-ray unit, and treatment facilities. Not only should the centres train persons from the countries in which they are situated, but some of them also persons from other countries in the region. Formal plans for teaching and training courses should be evolved. WHO's contribution should include provision of teachers and of fellowships for trainees. The committee added that, except in the case of senior individuals, fellowships should, in their opinion, be henceforth used mainly for attendance of trainees at these local courses, rather than for visits to miscellaneous places abroad.

3. Streptomycin

(a) The committee noted that WHO had undertaken to follow up, from the technical point of view, the work done in countries that had received streptomycin from UNICEF, and it is hoped that reports from these countries will be available shortly.⁷ However, the committee is doubtful whether the information, when pooled in the way planned, will do more than provide a general record of the work done, with numbers and types of cases treated. If a more valuable research contribution is to be achieved, it will probably be necessary to form a specialist study-group.

(b) The committee feels that a meeting of a subcommittee on streptomycin is unnecessary in 1949. However, owing to important research developments since the first meeting, held in New York 30 to 31 July 1948,⁸ the committee strongly recommends that a new subcommittee on streptomycin should be convened in 1950, with terms of reference to cover other aspects of chemotherapy of tuberculosis besides streptomycin treatment. It would be convenient if such a meeting were held about the same time as the 11th Conference of the International Union against Tuberculosis, to be held in Copenhagen in September 1950, where this subject will be one of the items under discussion.

(c) The committee noted the letter sent to Member States and their public-health administrations by the Director-General on 19 April 1949, concerning the need for avoiding, or at least delaying, the creation of streptomycin-resistant strains of tubercle bacilli. It recommends that, in addition, attention be drawn to the inadvisability of the unrestricted distribution and indiscriminate use of streptomycin, for the following reasons :

- (i) In spite of the reduced toxicity of new forms of streptomycin, the drug must still be regarded as dangerous.

⁷ *Off. Rec. World Hlth Org.* 22, 45

⁸ *Off. Rec. World Hlth Org.* 15, 11

- (ii) Precise knowledge as to its clinical indications, especially in pulmonary tuberculosis, does not yet exist.
- (iii) The attention of the public would be focused on this drug in a manner out of all proportion to its value in the total campaign against tuberculosis.

4. Inexpensive Institutional Accommodation for the Tuberculous

Following instructions given at the third session of the Expert Committee on Tuberculosis, a number of firms in Europe and America was approached with a view to obtaining information on this subject. The documentation was presented to the committee. Having considered this information, the committee wishes to recommend strongly that WHO encourage the use of simple and inexpensive types of construction, which can be quickly erected, for institutional care of the tuberculous in countries where the need of beds is urgent, but which, for various reasons, may not be in a position to erect more permanent buildings. The committee is of the opinion that these inexpensive buildings serve the purpose in a satisfactory manner.

5. BCG Vaccination

The committee discussed at length the indications for large-scale BCG vaccination, because a number of its members felt that its views on this matter should be available.

The following statement was accepted :

By sponsoring the international BCG vaccination campaign of the Joint Enterprise, WHO has already acted on the basis of the opinion that BCG vaccination is able to increase the resistance of an uninfected individual against subsequent tuberculosis. It is considered that the number of individuals who would benefit from BCG vaccination on a large scale would be especially large in communities where tuberculous infection and disease are frequent. Mass vaccination with BCG should, therefore, be recommended especially for communities with high tuberculosis infection rates and mortalities. It is, however, recommended that, even in countries where tuberculous infection and disease are relatively infrequent, vaccination be applied to individuals and groups with high degrees of exposure to tuberculosis, such as familial contacts and persons with occupational hazards.

The committee recommends that further special investigations be carried out in order that a more precise appreciation may be reached of the degree of benefit of BCG as a large-scale measure in tuberculosis control in different populations.

6. Relationship with Other International Organizations

(a) *International Union against Tuberculosis*

The Secretary-General of the International Union against Tuberculosis presented the plans of his organization for the immediate future. These plans include a review of the Constitution of the Union, and the appointment of a full-time Executive Director who will, in addition to his other duties, endeavour to increase the financial resources of the Union during the next few years.

In the meantime, the Union will continue its work in the educational and scientific fields, to convene conferences, and to publish the *Bulletin of the International Union against Tuberculosis* at quarterly intervals. The committee is fully in accord with the plans of the International Union against Tuberculosis and recommends that WHO, through its field staff, promote the development of voluntary antituberculosis associations in countries where such societies do not exist, and encourage their affiliation with the International Union against Tuberculosis.

(b) *League of Red Cross Societies*

The Director of the Health Bureau of the League of Red Cross Societies had previously requested an opportunity to discuss the role of the League in international tuberculosis control. He explained the work of his organization and sought suggestions from the committee on the way in which the League could assist, through its 68 national organizations, in tuberculosis control throughout the world.

The committee appreciated the clear explanation of the work of the League of Red Cross Societies and the generous offer of assistance, and informed the Director that this whole problem would be further discussed during the present meeting and that he would be informed of any action recommended by the committee.

(c) *Joint Enterprise*

The committee has studied in detail the need for tuberculosis control, and realizes that this need is so great in many countries that the activities of the Joint Enterprise should be continued and expanded into fields of tuberculosis control where such services are needed, but which cannot be provided by WHO because of inadequate funds and personnel.

The committee therefore recommends that WHO request the Joint Enterprise to present proposals for the continuation and expansion of its activities which can be carried on in co-operation with WHO and under the latter's technical supervision and guidance.

(d) *Joint meetings*

The committee further recommends that the full resources of WHO, the Joint Enterprise, and affiliated non-governmental organizations can best be utilized by calling together, at suitable intervals, representatives of those organizations working jointly in tuberculosis control. These organizations include: the World Health Organization, the Joint Enterprise, the International Union against Tuberculosis, and the League of Red Cross Societies.⁹

7. **Technique of Demonstration of Tubercle Bacilli**

The committee was informed that the WHO Expert Committee on Biological Standardization was considering setting up minimum standards for the technique of demonstration of tubercle bacilli. The committee welcomes this development and suggests that, in the event of such standards being instituted, it should receive, for information and comment, all relevant reports.

8. **Classification of Pulmonary Tuberculosis**

A proposed classification of pulmonary tuberculosis (4-digit code), prepared by two members of the ad hoc committee, had been circulated in December 1948 to a large number of governments and, at their request, to unofficial bodies. Many helpful comments and constructive criticisms have been received and the committee expressed its appreciation of the co-operation given. The committee agrees that, in principle, such a code is desirable, and recommends that the original document, together with the criticisms, be referred to the WHO Tuberculosis Research Office, Copenhagen, with the request that the latter develop the classification further in consultation with clinicians, and report to the committee at its next meeting.

9. **Report of the WHO Tuberculosis Research Office, Copenhagen**

The committee received the progress report of the WHO Tuberculosis Research Office, elaborated by the Director of the Office, who also explained in detail the way in which its future work is envisaged. Docu-

⁹ The Executive Board, at its fifth session, adopted the following resolution:

The Executive Board

- (1) NOTES the resolution adopted by the Executive Committee of the League of Red Cross Societies concerning the international tuberculosis campaign;
- (2) EXPRESSES its appreciation of the recommendation made to the National Red Cross Societies to take as active a part as possible in this campaign;
- (3) APPROVES the recommendation of the expert committee to call together, at suitable intervals, representatives of the organizations which will be working jointly in tuberculosis control.

mentation on the results of the international BCG campaign of the Joint Enterprise was presented, using the material from Poland as an illustration. Furthermore, the committee heard, with great interest, other plans, including that for the evaluation of the effect of BCG vaccination in Finland.

The work of the WHO Tuberculosis Research Office is still in its early stages, and the committee looks forward to its development along the lines suggested, which it approves.

The committee recommends :

(a) that the terms of reference of the WHO Tuberculosis Research Office should include all public-health aspects of tuberculosis, particularly those in which WHO has commitments ;

(b) that the work of the Office should be linked with national work of a similar kind, which it should seek to stimulate ;

(c) that the opportunity should be taken to train epidemiological research workers through experience in the Office.

10. Nursing of the Tuberculous

The committee discussed the serious shortage of nurses in tuberculosis institutions, a problem with which many countries are confronted today. Considering this question to be of the greatest importance, the committee recommends that the whole matter be fully considered by the Nursing Section of WHO. Furthermore, it asks the Secretariat to circulate to members as complete information on the subject as possible for discussion at the next meeting of the committee, at which a representative of the WHO Nursing Section should be present.

11. Plan for the Immediate Future

The committee reviewed the work of the Tuberculosis Section of WHO and made certain detailed recommendations, which have been mentioned already. The committee considers that it is of the greatest importance to have definite plans for the tuberculosis work of WHO in the immediate future. In order to guide WHO in planning operations for field work in 1949-50 within the broad limits set by the World Health Assembly, the following recommendations are made.

At the same time, the committee suggests that at its next meeting documents should be presented showing the state of fulfilment of the current operational plan, together with the plan for 1951 and the subsequent few years, and that these documents should include priorities and time-schedules.

(a) Surveys

The committee recommends that, for the next few years, tuberculosis survey work by WHO should be limited to countries that have requested from WHO help in the form of demonstration services or other physical assistance; such requests should be a prerequisite to the granting of assistance. This survey work should be carried out by WHO, preferably by its tuberculosis regional advisers, and not by temporary consultants.

Information on the extent of the tuberculosis problem throughout the world, not necessarily in connexion with immediate assistance, can be collected and kept up-to-date by the tuberculosis regional advisers during their routine work. This information may be supplemented by reports from corresponding members and affiliated organizations.

(b) Selection of countries for assistance

The committee recommends that WHO should give assistance primarily to at least one country in each region, in order to demonstrate in the region the value of such work. In the further selection of countries to receive aid, WHO should be guided not only by needs, but also by chances of success.

(c) Recruitment and training of personnel in tuberculosis work

The committee recommends that the highest priority should be given by WHO to assistance in the establishment of at least one teaching and training centre in each region. The centre should undertake the training of basic personnel in all aspects of tuberculosis. Its staff should be recruited from the country in which it is situated, supplemented, where necessary, by specialists supplied by WHO. Besides training personnel, these centres can provide demonstrations of tuberculosis work. Field teams provided by WHO during the next few years should be employed preferably in this way.

Steps should be taken to ensure some uniformity in the work carried out by the field teams provided by WHO in these demonstration and training centres in different parts of the world, as well as to ensure adequate levels of teaching at the different centres. The committee recommends that use should be made of existing facilities for providing prior training of such teams. The problem of recruiting and training tuberculosis personnel is so great that consideration should be given to the loan, full-time, to the Tuberculosis Section of a member of the Division of Professional and Technical Education, for this task.

(d) *Field demonstration teams*

The committee recommends that field demonstration teams should be used primarily, as recommended above, to work closely with training centres in the regions. Efforts should be made to send at least one such demonstration team to each region during the next few years, and, if possible, during 1949-50. The committee re-emphasizes that the criterion of selection of countries for receipt of such teams should be that the work done will be of permanent and not of passing value.

(e) *Supplies*

The committee recommends that WHO should make provision, from its budget, for supplies and equipment for its own field teams. Resources that may be available from other organizations should be used to supplement the needs of these teams.

Annex 1**PLAN FOR CONTROL PROGRAMMES****Suggestions for the Control of Tuberculosis in Countries
with Undeveloped and Underdeveloped Programmes**

The WHO Expert Committee on Tuberculosis has already, at its first meeting, laid down the essentials of a comprehensive tuberculosis control programme. It realizes that such a programme must be developed step by step, in proper order, depending upon the local situation in each country. The pattern has to be modified to meet the varying needs, resources, and attitudes of the peoples concerned. In the present document, the committee sets forth the outline of a workable plan of tuberculosis control in countries with little or no existing programme.

At the outset, the committee would stress the necessity for always keeping in mind the fundamental contribution to the decline in tuberculosis in a country which can be made by improvements in the nutrition, housing, education, occupational health, and other elements in the standard of living of its people. Nevertheless, direct measures in tuberculosis control also can make a valuable contribution to this end.

The epidemiological principles of the control of a chronic infectious disease like tuberculosis must always be kept in the foreground. A sound plan for the control of this disease must have the following objectives :

- (1) the prevention of spread of tuberculosis from known infectious cases ;
- (2) the protection of groups highly exposed to tuberculosis and most likely to get the disease ;
- (3) the furthering of all other preventive and curative measures, including after-care and rehabilitation.

In order to accomplish these objectives there are definite steps that can be taken, in the following order :

1. Survey

A survey of the needs, resources, and attitudes of the people in the country must be made by an expert in tuberculosis. Where assistance is requested from WHO, the Organization should be prepared to provide

an international expert. The survey should be made in the shortest possible time and in co-operation with the leader in tuberculosis control in the country being surveyed, from whom can be obtained most quickly all available data, and also the opinions of other tuberculosis specialists in the country. It may be necessary to make a sample survey by means of tuberculin tests, and a mass-radiography unit combined with temporary laboratory facilities, so as to determine the infection-rate and morbidity in various segments of the population. To obtain further information on the attitudes of the people in the country, it is highly desirable to meet jointly with representatives of the medical profession and also of voluntary groups interested in tuberculosis, so as to obtain the opinion of all types of people, to stimulate their interest, and to gain their support.

A written document must be prepared which will include all the pertinent quantitative data bearing on the problem.

2. Recruitment and Training of Personnel

The second step is to find a leader in tuberculosis control — either someone recruited locally and trained to become the leader, or someone brought in temporarily from outside — who will develop and direct the central group which will initiate and carry on tuberculosis-control activities in the country.

This central group must be so chosen that the following fields of activity are covered: public-health administration, epidemiology, laboratory and clinical work, and public-health nursing.

One person of the group could cover more than one of the specialities mentioned. However, the leader must have training in public-health administration. It may not be possible to obtain a complete group at the beginning of the programme. In many countries the best assistance that WHO can give to help control tuberculosis will be to train personnel as a group in special centres where they can train together. Thus, assistance can be given in the establishment of national centres of training, which can also serve international purposes. After training, the central group must take responsibility and initiative in its country in training other personnel who will serve as members of field teams throughout the country as the programme develops.

The person chosen to be the leader must be a government employee, and must be the official in charge of tuberculosis control in the country.

Every effort should be made from the beginning of the programme to employ full-time personnel, not only as team leaders but also in dispensary, institutional and other work.

3. Exact Diagnosis

Provision must be made for the exact diagnosis of infectious cases of tuberculosis by means of demonstration of tubercle bacilli by modern culture methods. In each country it is essential to have a central laboratory, possibly associated with a general bacteriological laboratory, so as to ensure uniformity and correctness of diagnosis throughout the country, and so as to provide a training centre. In countries with large populations it may be necessary, for purposes of efficiency and economy, to establish sub-laboratories.

4. Records

There is little value in setting up a complicated system of reporting cases and deaths from tuberculosis until a sound system of providing bacteriological evidence of the disease has been instituted. Where recording of tuberculosis data is rudimentary, simple records must be kept in the central control office of those cases diagnosed definitely as tuberculosis by laboratory examination, so that there may be accurate information at least on this number of cases. These records could form the nucleus of a more comprehensive record system on all cases of tuberculosis when it becomes possible to extend compulsory reporting of this disease throughout the nation. Even in countries with a somewhat more developed recording and reporting system, it is desirable to keep the figures for laboratory-diagnosed cases separate from all others, and always to place more emphasis on the former.

5. Home-Nursing Services

It has already been stated that the most important objective in tuberculosis control is the prevention of spread of the disease from known infectious cases. This can best be done by isolation in hospitals; unfortunately, there are numerous countries where the inadequacy of institutional facilities makes this impossible.

Home-nursing or health-visiting services must be established and expanded in order to reduce the amount of infection spread in the home from known cases. The visiting nurse or health visitor can teach the patient and the family how to dispose of infectious material, and how to obtain at least partial isolation of the patient in the home. Such services can be an important part of the field programme for tuberculosis control. In those countries where no visiting nurses are yet available, WHO can make a great contribution to tuberculosis control by assisting in the provision of training for persons who can carry on this activity.

It is recognized that the home-nursing or health-visiting services at best can accomplish only partial segregation of infectious cases, and will be even more effective when adequate hospital facilities are also provided.

6. Dispensaries

As soon as qualified personnel can be recruited or trained, efforts must be directed towards establishing dispensaries, where possible associated with existing hospitals or public-health centres. These dispensaries should be centres for tuberculosis control in the communities in which they are located. Stress should be laid on the preventive and social aspects of dispensary work, including examination and care of contacts, supervision and after-care of patients, and home visiting. Here again, WHO can assist greatly by providing training for the different types of personnel needed.

Comment

The committee is firmly convinced that mass radiography should not be employed where there are few or no facilities, such as laboratory and dispensary services, for the exact diagnosis and supervision of patients. In other words, it is of little value simply to take thousands of x-ray films of the lungs of people and then do nothing more about the matter. Even for the assessment of morbidity, dependence upon x-ray photographs alone is inadequate. As a control procedure, mass radiography can be fully effective only in countries prepared to examine and follow through large groups of the population within a definite period of time. On the other hand, if large numbers of expectorating persons, requiring as they do sputum examination to confirm or exclude the diagnosis of infectious tuberculosis, are already known to physicians in the country, there is no point in detecting an additional number of suspect or minimal cases by mass radiography until laboratory examinations and exact diagnoses have been made of the expectorating group. The examination of sputa of this group is far less costly, considered in its yield of cases, than mass radiography for finding the principal sources of spread of the disease. In making these recommendations, the committee is bearing in mind that mass radiography is only one instrument in the struggle against tuberculosis, and its introduction should not be allowed to advance out of step with other procedures.

7. Hospital Facilities

At the same time as the introduction of dispensaries, a realistic plan should be developed to obtain hospital facilities for isolation and treatment of infectious cases of tuberculosis.

The number of beds needed and the time schedule for their procurement can best be determined by a study of the current local situation of the country concerned. The commonly used ratios — number of beds per annual deaths, or number of beds per reported annual new cases — have little applicability from one country to another.

Efforts should be made to obtain the simplest hospital facilities. WHO can assist by providing information on suitable types of inexpensive buildings and by facilitating their procurement.

Since the principal purpose of the institutional programme is to provide isolation of infectious cases, it is recommended that preference in institutional care should be given to persons with positive sputum, particularly where home conditions are likely to favour the spread of infection.

A further point to be stressed is that the modern conception of tuberculosis institutional care is away from the isolated sanatorium, depending on presumed climatic advantages, and towards accommodation located near the centres of population concerned, with the consequent advantages of more-easily available technical and personnel facilities, cheaper services, and easier transport.

The advantages of institutional treatment may be lost by an early breakdown of the patient and further spread of his infection to others after discharge, unless attention be paid to his after-care. If no other forms of social assistance are available, one method that might be explored is the provision of village centres where the patient and his family can be transferred after his institutional treatment, and where medical supervision can be continued. The houses in such a centre may be of a simple type; facilities for suitable productive work should be provided.

Comment

From the foregoing, it is evident that the committee feels strongly that countries with very small funds at their disposal should not expend these on the construction and maintenance of elaborate types of sanatoria. Such costly institutions will provide care only for a relatively small number of patients; they will have little effect on the total tuberculosis-control problem of the country, and, judging from previous experience, their costliness may result in a hold-up in the provision of further measures for such control. The main purpose is to provide the largest number of hospital beds for the isolation of positive sputum cases, although at the same time it will be necessary to provide a reasonable amount of treatment for these patients. Such a recommendation does not exclude the establishment of one or more model schemes of tuberculosis control for training purposes, but the needs of even these can usually be satisfactorily met by inexpensive buildings of simple construction, containing first-class

equipment, which should not require disproportionate expenditure. Personnel and equipment, rather than the building itself, are the essentials for a good hospital.

8. Other Measures

Among other measures that need consideration are the following, which can be taken at any time during the development of the major aspects of the programme :

BCG vaccination

The only practical way so far known for producing specific resistance against tuberculosis, even if this resistance is not absolute, is BCG vaccination. However, this method alone cannot be expected to control the disease. The full effectiveness of BCG vaccination will be achieved only if it is carried out as part of a general programme of tuberculosis control.

Health education

Throughout the development of the tuberculosis programme, intensive education of the public in recognizing the importance of tuberculosis and of the plans to control it in the country should be undertaken. In this endeavour, national and local voluntary organizations can play a valuable part by co-operating with the official bodies.

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