

The
Medical
Research
Council
Report of the
Committee on Tuberculosis in
War-time

Privy Council

MEDICAL RESEARCH
COUNCIL

REPORT OF THE
COMMITTEE ON TUBERCULOSIS IN
WAR-TIME



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Terms of Reference of the Committee.—To assist in promoting an investigation of the extent and causes of the war-time increase in the incidence of tuberculosis, particularly among young women, and also to advise the Council regarding possible preventive measures.

PREFACE

The Committee on Tuberculosis in War-time was appointed by the Medical Research Council, at the request of the Ministry of Health, in the autumn of 1941. It had already become evident that in the present war—as in that of 1914–18—there had been a reversal of the favourable pre-war trend of mortality from tuberculosis; and, on the analogy of the earlier experience, it seemed likely that the death-rates from this disease would continue to increase unless steps could be taken to deal with the determining factors and to limit the spread of infection. In 1939 and 1940 the increased mortality appeared to be mainly in young women, and the Committee's terms of reference, given on page ii, specifically refer to this aspect of the problem. The Committee's survey of the position up to the early part of 1942, however, shows that all age-groups have been involved to some extent in the increased mortality from tuberculosis, and that those affected include not only young women but also children and the older male age-groups. Details of this survey are given in the following report. The causes of the increase are analysed by the Committee in the light of existing knowledge, and various measures of a public health and administrative nature are recommended for dealing with it.

The present report differs from those usually published in the Council's series in that, apart from statistical analyses of existing data, it describes no new researches, but consists rather of a critical review of available evidence, and gives the Committee's practical recommendations based upon it. A new programme of statistical, clinical and pathological researches in tuberculosis would necessarily take much longer to complete, and, in the Committee's view, sufficient evidence already exists to justify administrative action on the lines here indicated. Apart from its intrinsic importance, tuberculosis is a sensitive index of the public health, and any increase in its incidence and fatality—and the inauguration of measures for dealing with it—are matters of urgent public concern. The Committee has therefore prepared this report on the present situation, and the Council are glad to include it in their series.

MEDICAL RESEARCH COUNCIL,
c/o London School of Hygiene,
Keppel Street, London, W.C.1.

15th September, 1942.

REPORT OF THE COMMITTEE ON TUBERCULOSIS IN WAR-TIME

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1. Present Knowledge of the Types and Development of Tuberculosis

Tuberculosis in man is caused by either the human or the bovine type of tubercle bacillus. Bacilli of the human type are derived from the cough spray and expectoration of persons suffering from pulmonary tuberculosis, and reach the lung by way of the air passages. Bacilli of the bovine type are found in the milk of cows with tuberculosis of the udder, and gain access to the human body by the alimentary tract. The bacilli of either type, whether introduced as the result of inhalation or ingestion, may sooner or later be carried by the lymphatics or the blood stream to other parts of the body.

For statistical purposes it is convenient to refer to "respiratory" or "pulmonary" tuberculosis when the disease predominantly affects the lungs, and to "non-respiratory" or "non-pulmonary" tuberculosis when it predominantly affects other organs, such as the glands, bones and joints, the meninges, or the genito-urinary system. It must be understood, however, that lesions in one organ may be accompanied or followed by lesions in others.

APPENDIX

REPORT BY TECHNICAL SUB-COMMITTEE
 APPARATUS FOR MASS MINIATURE (INDIRECT) RADIOGRAPHY FOR
 DETECTION OF PULMONARY TUBERCULOSIS

TECHNICAL SUB-COMMITTEE

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In the opinion of the Technical Sub-Committee, full-sized direct radiography on a first-class apparatus is the best method of mass radiography, but, where the numbers are too great to make this method practicable and speed is essential, the most suitable means at present is indirect radiography with miniature films. From experience of the existing plants, after special tests and comparisons, the Sub-Committee makes certain recommendations on apparatus, to serve as a guide to those wishing to carry out examinations of large numbers of persons by miniature radiography.

There are two main types of apparatus:—

- (a) 5 by 4-inch individual films, and
- (b) 35 mm. cine film.

Type (a) is becoming popular in the U.S.A., and the Ministry of Health has taken steps to import a small number of complete units. This type is not at present obtainable in Great Britain; nor is its manufacture at the moment practicable, on account of the difficulty in obtaining the special lens required for the camera.

Type (b) (the results with which are at least equal to those with Type (a)) can be produced in this country because suitable lenses are available, and plants are already in use in the three Services and in certain industrial centres. In the Sub-Committee's view, the apparatus of this type can give satisfactory results for mass radiography at speed, provided that the following essentials are embodied in the manufacture:—

- (1) A high tension power unit with 4 valve rectification, having an output of at least 100 mA at 90 kVp, and 200 mA at 80 kVp.
- (2) A rotating anode tube of fine focus, not exceeding 1.5 mm. square, with a reserve tube.
- (3) An efficient stationary radiographic grid and a suitable fluorescent screen, both of which should measure not less than 16 by 16 inches.
- (4) An electrically controlled camera, the control being linked with the X-ray exposure switch. It should take 50 to 100 feet of film which can be removed in exposed lengths as required. A 5 cm. f 1.5 Sonnar Lens is recommended until such time as a special approved lens is manufactured for the purpose.
- (5) A photographically-recording identification device, with electrical control linked with the X-ray exposure switch; identification of film with patient must be infallible.
- (6) Provision for taking full-size radiographs of the chest.
- (7) Provision for a wide range of heights of subjects, including children.
- (8) The apparatus should be made to permit the subjects to pass rapidly through in one direction.
- (9) Adequate protection for operators from excessive radiation.
- (10) The question of mobility should be considered before manufacture. If necessary, the apparatus should be built for transportability by van, and for rapid re-assembly within a few hours. Precision of assembly is imperative.
- (11) It is advisable that the van used for transporting the apparatus should be as a darkroom.
- (12) At each centre an adequate electric main supply is necessary. A mobile generator should be incorporated with the unit.

The number of staff and the available accommodation will determine the speed of working such an apparatus. For mass radiography at speed the following staff might be required :—

- (1) A radiologist with special experience of chest work, working in conjunction with a chest physician, e.g. a tuberculosis officer. Familiarity with the work done at established miniature radiography centres is desirable.
- (2) Two radiographers, specially trained for this work.
- (3) Darkroom assistant, also specially trained for this work.
- (4) Marshals and clerical staff (four to six).

The Technical Sub-Committee recommends that the miniature films should be processed locally. Persons whose films show a suspected radiographic abnormality should be examined by a full-sized radiograph; if this confirms the abnormality, the individual should have full clinical and laboratory examination. No diagnosis other than "suspected abnormality" should be made on the miniature film, the full diagnosis depending on the further examination.

The above description gives only the essential features of the apparatus, staff and procedure recommended. A miniature radiography unit of this type is being made at present for the Medical Research Council.

Finally, the Technical Sub-Committee wishes to emphasise that mass miniature radiography should not be lightly undertaken. A very high standard of quality of miniature radiograph is necessary for correct interpretation, and the latter requires the highest radiological skill. The making-up of compromise apparatus cannot be too strongly condemned and would bring the method into disrepute.

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