

MASS MINIATURE RADIOGRAPHY OF
CIVILIANS.



PRIVY COUNCIL

MEDICAL RESEARCH COUNCIL

SPECIAL REPORT SERIES No. 251

MASS MINIATURE RADIOGRAPHY OF CIVILIANS

For the Detection of Pulmonary Tuberculosis

(Guide to Administration and Technique with a Mobile Apparatus using 35-mm.
Film : and Results of a Survey)

by

KATHLEEN C. CLARK

P. D'ARCY HART

PETER KERLEY

and **BRIAN C. THOMPSON**

LONDON : HIS MAJESTY'S STATIONERY OFFICE

1945

Price 3s. 0d. net

Universal Decimal Classification

- 616.24—002.5—073.756.5 ; 778.33

MEDICAL RESEARCH COUNCIL

The Rt. Hon. LORD BALFOUR OF BURLEIGH (*Chairman*).

Sir WILLIAM GOODENOUGH, Bart., D.L., J.P. (*Treasurer*).

Sir CHARLES MACANDREW, T.D., M.P.

Professor S. P. BEDSON, M.D., F.R.S.

Sir ERNEST ROCK CARLING, F.R.C.S.

Sir HENRY H. DALE, O.M., G.B.E., M.D., F.R.C.P., P.R.S.

Professor D KEILIN, Sc.D., F.R.S.

Professor F. C. BARTLETT, C.B.E., F.R.S.

Professor L. J. WITTS, M.D., F.R.C.P.

Professor J. R. LEARMONTH, Ch.M., F.R.C.S.E.

A. N. DRURY, C.B.E., M.D., F.R.S.

Professor J. C. SPENCE, M.C., M.D., F.R.C.P.

Sir EDWARD MELLANBY, K.C.B., M.D., F.R.C.P., F.R.S. (*Secretary*).

PREFACE

In the autumn of 1941, at the request of the Ministry of Health, the Medical Research Council appointed their Committee on Tuberculosis in War-Time; and in October, 1942, this Committee issued a report (*M.R.C. Special Report Series No. 246*). One of the proposals made in the report was for the controlled use of mass radiography among the civilian population. This recommendation was accepted by the Government.

The first difficulty was the lack of suitable X-ray apparatus in this country. In order to ensure the availability of a standardised instrument of high quality, the Committee on Tuberculosis in War-Time had appointed a Technical Sub-Committee to make recommendations on the essentials of a suitable design; these were given in an appendix to the report mentioned. An excellent instrument was designed to a specification embodying these essential features, and approved by the Sub-Committee; and in the spring of 1943 the Ministry of Health and the Department of Health for Scotland announced that a limited number of mobile miniature radiography sets of this design were in the course of production at their request, and would be allocated in the first instance to selected local authorities in Great Britain.

The first set was purchased by the Medical Research Council themselves, who had received a recommendation from the Committee that a survey be conducted for research purposes on a few selected civilian population groups. Such a survey was a logical sequence to the Committee's report, and the team formed by the Council to carry it out included the secretary of the Committee and two members of the Technical Sub-Committee; these are also authors of the present report.

The objects of the investigation were three-fold: first, to discover the technical, administrative and social problems arising from civilian mass radiography, and to establish standard methods and procedures, in order to assist those responsible for the routine of the national scheme; second, to estimate the incidence of tuberculosis during war-time in various civilian groups, and to assist the authorities by estimating the demands likely to be made on the tuberculosis services as a result of mass radiography; third, possibly to throw light on the epidemiology of the disease. Thus, the purpose of the inquiry was as much guidance to others as the collection of statistical information. Indeed, many improvements were suggested by the experience gained, and these have already been incorporated in the manufacture of the X-ray apparatus, and in the training now being given to the teams that are to work under the local authorities in the national mass radiography scheme. Three of the authors of the present report have taken part in this training, which has been organised by Miss Clark on behalf of the Ministry of Health, and has already been completed for more than a dozen teams; and one of them (Dr. Kerley) has been appointed a Consultant Adviser on Mass Radiography to the Ministry.

The survey occupied the greater part of 1943; it covered approximately 23,000 persons from two factories, a large office group and a mental hospital, all of which were in Greater London. A description of the methods and results is given, together with suggestions for other workers in this field. The survey was purposely limited in size and scope, but, on the other hand, much time and care were spent on experiments in organisation, technique and interpretation, and the information has been exhaustively analysed.

The report is divided into two parts. Part I is a guide to the administration and technique of civilian mass radiography ; and Part II contains the statistical results of the 1943 survey by the Council's Unit, with discussion of associated problems.

It is recognised that the problems involved in mass radiography in civilian life differ to a large extent from those in the Services, where most of this type of work in Britain has so far been done. Hence the present report, by persons who have been closely associated with the development here of this diagnostic weapon, should be of considerable value in the early years of the civilian national scheme. It may also be useful in regard to similar schemes proposed in other countries, including liberated countries in Europe.

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

15th September, 1944.

MASS MINIATURE RADIOGRAPHY OF CIVILIANS

For the Detection of Pulmonary Tuberculosis

(Guide to Administration and Technique with a Mobile Apparatus using 35-mm. Film : and Results of a Survey)

BY

KATHLEEN C. CLARK, M.B.E., F.S.R.

(Principal, Radiographic Technical and Demonstration Department, Ilford Limited)

P. D'ARCY HART, M.D., F.R.C.P.

(Member of the Scientific Staff, Medical Research Council)

PETER KERLEY, M.D., F.R.C.P., F.F.R., D.M.R.E.

(Physician to X-Ray Department, Westminster Hospital and Royal Chest Hospital)

AND

BRIAN C. THOMPSON, M.D.

(Tuberculosis Physician, Middlesex County Council)

CONTENTS

PART I. GUIDE TO ADMINISTRATION AND TECHNIQUE OF CIVILIAN MASS RADIOGRAPHY

Section	Page
1. The development of mass radiography	1
2. Equipment and personnel for a mass radiography unit	2
3. Approach to civilian groups—propaganda and preliminary arrangements	7
4. Preliminary technical arrangements	11
5. The Unit at work : Moving in—general and X-ray procedure—clerical work	18
6. The Unit at work (<i>continued</i>) : Positioning—exposure technique—darkroom procedure—viewing—protection	37
7. Procedure after interpretation of large films	54
8. The chest clinic and mass radiography	64

PART II. RESULTS OF THE MEDICAL RESEARCH COUNCIL SURVEY, 1943

9. Scope of inquiry	68
10. Methods used	69
11. Results for the individual groups	71
12. The incidence of tuberculosis as revealed by mass radiography	87
13. Previously diagnosed pulmonary tuberculosis encountered in industrial mass radiography	94
14. Non-tuberculous lesions revealed by mass radiography	95
15. Bacteriological investigation in mass radiography	96
16. Symptoms of mass radiography patients and their bearing on the value of this method	102
17. Contributions to the epidemiology of tuberculosis provided by mass radiography	104
18. Associated problems of mass radiography	111

Acknowledgments	116
References	117

Appendix 1. Detailed list of accessories for mass radiography, with particular reference to the requirements for temporary premises	119
2. Description of surveys referred to in this report	123
3. Directional notices	128
4. Weekly time sheet	128
5. Darkroom charts	130
6. Suggested requirements for a mass radiography processing-unit	132
7. Deaths and new cases of tuberculosis in Great Britain, 1938-43	133

Supplementary report : Re-investigation of Factory Group A after one year, by W. Pointon Dick, M.R.C.S., L.R.C.P. (Medical Director of Mass Radiography Unit, and Assistant Tuberculosis Physician, Middlesex County Council)	134
---	-----