TUBERCULOSIS IN MALTA
SOME FACTS AND FIGURES

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Introduction

In Malta pulmonary tuberculosis as such was included in the Schedule of notifiable diseases in 1908. For some inexplicable reason, it was only 40 years later that other forms of tuberculosis became notifiable by law.

A government hospital for pulmonary tuberculosis existed since the beginning of this century, but it was in 1948 that a proper "contact" clinic was established for the first time and methods of control of the disease set on a sound basis. In 1950, under the auspices of the International Tuberculosis Campaign, an expert medical and para-medical team from Norway together with four Maltese teams carried out a Tuberculin Survey of a section of the population, mostly persons aged 1-18 years, and vaccinated with B.C.G. the negative reactors. (Report on the Health Conditions of the Maltese Islands, 1950; Zammit Tabona, 1952). Since then, Tuberculin testing and B.C.G. vaccination have been carried out routinely in school-children (in 12-14 years old only since 1960) as a yearly campaign, as well as in contacts and in persons at risk of infection.

All anti-tuberculosis drugs have been available locally at all times and in sufficient quantities. Treatment in and out of hospital as well as supplies of drugs are given free to tuberculosis patients and their families at Government expense, and a grant to a maximum of about £M12 monthly, is allowed provided that both the patient and members of the same household call regularly for supervision of treatment and for periodical examination.

It is relevant to note that the Maltese

Islands cover an area of 121.8 square miles (the island of Malta by itself is 94.8 square miles). In 1908 the population was 212,888 (population density of 1,815 per square miles) and by 1970 it had risen to 322,187 (population density 2,600 per square mile).

What follows is not a comprehensive or a comparative review of the local tuberculosis situation but only an appraisal of the results obtained since the disease became notifiable locally and since adequate methods for its control were set up. For this purpose three of the Indices which may reflect the progress of tuberculosis in a locality i.e. Notification rate, Mortality and Tuberculin Sensitivity will be discussed.

Indices of Tuberculosis
Notification Rate

Respiratory Tuberculosis (Fig. 1)

Since 1909 (280 notifications — 1.23 per 1,000 population) the notification rate has followed the same pattern as that of the more advanced countries, and, with the exception of two peaks, one (1918 — 330 notifications — 1.46 per 1,000 population) during the first and the other (1942 — 415 notifications — 1.54 per 1,000 population) during the Second World War, has been gradually falling. The rise in each of the two periods has a different explanation. In 1917-1919, the increase in the incidence of the disease was due to the Influenza pandemic, while during the last War it was the result of conditions existing in a besieged small island under constant aerial bombardment: malnutrition, over-crowding in underground shelters and in the homes, and enforced unhygienic conditions. By 1947, the notification rate had alreay returned to its pre-war level i.e. 0.72 per 1,000 population, to continue to decline steeply after the nineteen fifties to its present low level of 0.11 per 1,000. The decline has been less in the older age groups, especially in men, living alone and/or addicted to alcohol.

Other forms of Tuberculosis became notifiable at the end of 1949; during 1950 there were 106 persons notified, in 1970 only 16. But tuberculosis control cannot be better gauged then by the decline in the incidence of tuberculous meningitis: 17 in 1950; 1 in 1962; none in 1969 and none in 1971.

NO. OF T.B. MENINGITIS CASES FROM 1950 - 1971

1950	—	17
1951	—	17
1952	—	5
1953	—	18
1954	—	3
1955	—	7
1956	—	1
1957	—	1
1958	—	2
1959	—	2
1960	—	5
1961	—	3
1962	—	1
1963	—	1
1964	—	1
1965	—	1
1966	—	2
1967	—	1
1968	—	1
1969	—	0
1970	—	2
1971	—	0

Mortality (Fig. 2)

Except for the peak corresponding to the 1917-1919 period, when 323 persons died against 330 notifications, the mortality rate is a mirror-image of the notification rate, but at a lower level. For the last 60 years it has followed the pattern of most West European countries (McDonald and Springett, 1954). During the last 25 years it has decreased repidly to its present low level of 5 deaths (0.015 per 1,000 population), with a steep decline after 1945 when streptomycin and PAS became generally available, and again another sharp decline after 1952, following the use of Isoniazid. As in other countries where tuberculosis is under control, all deaths now occur in the older age groups, and are nearly always due to the effects of long-standing disease.

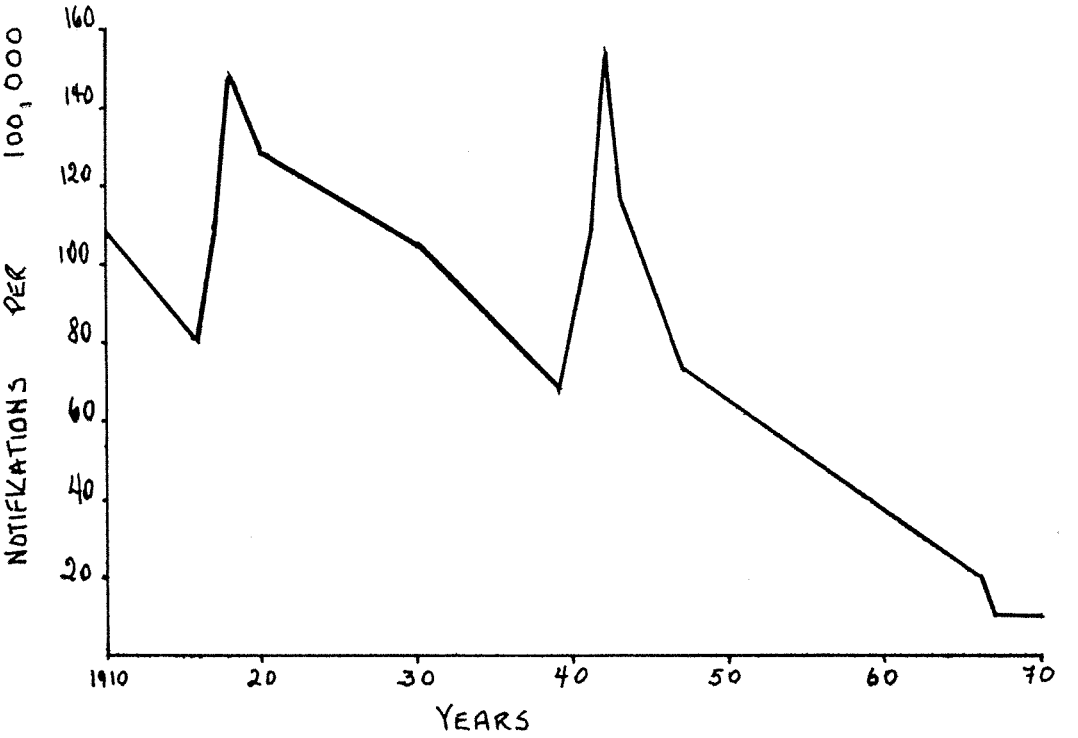

FIGURE 1

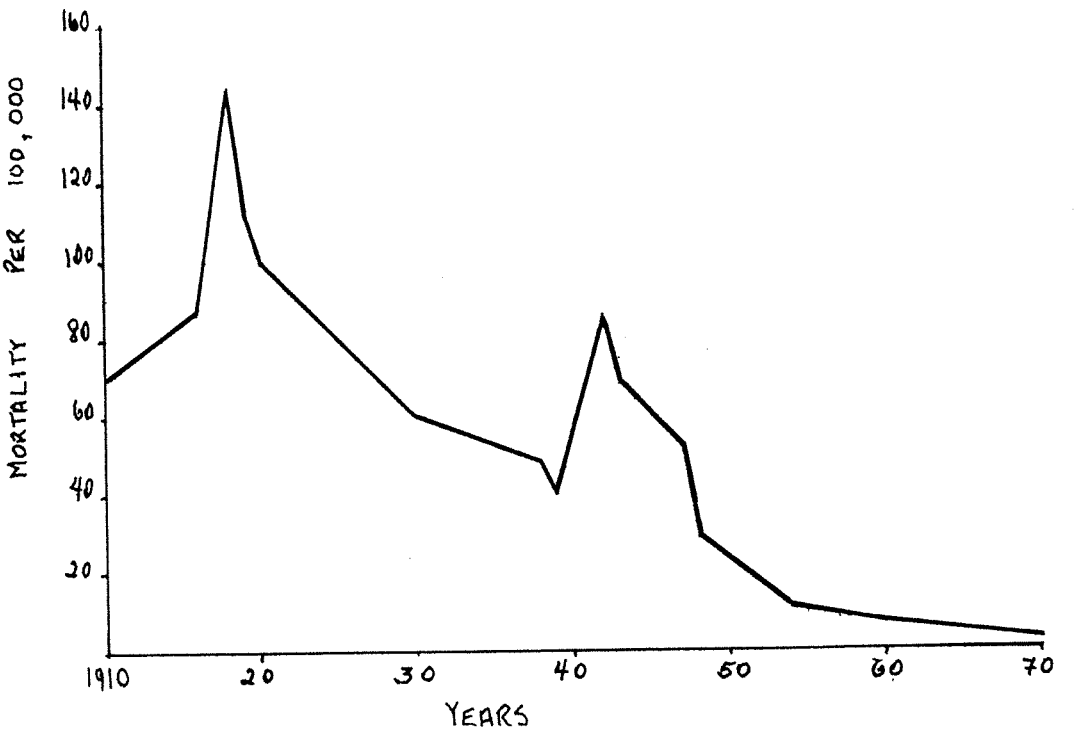

FIGURE II

As can be seen from Figure 1 and Figure 2 both the notification and the mortality rates started to decline much before modern methods of control and anti-tuberculosis drugs became available: this was due to many factors, but mainly to the improvement in the standard of living.

Tuberculin Sensitivity (Infection Rate)

The first large-scale Tuberculin Survey was started in 1950. Out of 10,736 children in the age-group 12-14 years, tested and read during 1950, 1952, 1953, 3,556 were positive reactors i.e. 33.1%. Of 7,951 children of the same age-group tested and read during 1969-1970, the number of positive reactors was 1,623 i.e. 20.4%. At first glance, this decrease in the infection rate does not appear impressive and does not seem to correspond to the dramatic decline in the notification and mortality rates covering the same period, but the results of the two surveys are not strictly comparable because of the different methods of testing used — Adrenalin-Pirquet, with Old Tuberculin, in the first case and Heaf Multiple Puncture Technique, with Protoderm P.P.D., in the second.

The Adrenalin-Pirquet Test has been shown to be as effective for detecting individuals "infected" with tuberculosis as the Mantoux Test with 10 T.U. non--specific reactions seeming to play a very small rôle. It has been found to be seldom negative in persons reacting to 0.1 mgm. O.T. (10 T.U.) by the Mantoux Technique and only 3.6% of total reactions with the 1 mgm. (100 T.U.) as final comparative test are missed by the Adrenalin-Pirquet when the limit to the A-P. Test was 3-4 mm. and that for the Mantoux Test 10 mm. induration (Geddes, 1957; Ustved, 1950). So that the 33.1% positivity rate in the 1950-53 survey may be taken as a fairly approximate index of Tuberculosis Infection.

On the other hand, the Heaf Test (with Protoderm P.P.D. — 100,000 T.U. per mil), is more sensitive than the Mantoux Test either at 5 or 10 T.U., yields more positive reactions including "false" ones, and gives similar *proportions* of positive results only to the 100 T.U. intracutaneous test.

It had been known for some time that most of the low grade sensitivity reactions with the Mantoux Test using larger doses of tuberculin are non-specific, especially in children. Since Edwards and Palmer in America (Edwards and Palmer, 1958; Edwards, Edwards and Palmer, 1959; Palmer, Edwards and Hopgood, 1959; Edwards and Edwards, 1960), proved that many of these reaction are due to cross-sensitivity with Mycobacteria other than tuberculosis, the same has been found in other countries.

There is convincing evidence that in Great Britain a Heaf Grade 1 response in young people almost always indicates non-specific sensitivity (Griffith, Bellamy & Davie, 1963; Griffith, Marks & Richards, 1963; Ross and Horne, 1969). Carruthers (1969) estimated that in Western Australia most school children reacting to Heaf Grade 1 are negative to the Mantoux Test, and, using different sensitins, he estimated that all these reactions were due to causes other than infection with *Mycobacterium tuberculosis*. Galbraith *et al.* (1972) showed that 289 children aged 12-14 years from the London borough of Newham found to be Heaf positive, only 12% reacting to Heaf Grade 1 were likely to have had a previous tuberculous infection. Moreover, it has been suggested (Tubercle, 1970) that in a country with a low and rapidly falling risk of infection — and this certainly applies to Malta — a "positive" Heaf Test could be taken as grade 2 or more.

When the 1,623 (20.4%) children found Heaf positive during the Malta survey are separated into the various grades, one finds that 1,251, 233, 41, and 98, belong to Heaf grade 1, 2, 3, 4, respectively. If conditions obtaining locally were the same as in other countries and if one considers that only 12% of the grade 1 reactions had any significance, then the number of children "infected" would be only 522 ,i.e. 6.6% and the infection rate in Maltese children aged 12-14 years would have decreased during the last twenty years from 33.1% to 6.0% and not to

20.4%. Of course, this is purely speculative, although this change in the risk of infection would be more in consonance with the decline in the number of notifications and in the mortality rate during the same period, *and with the decrease in the infection rate in children aged 5 years—5.5% in 1950 to the present 0.5%.*

Conclusion

The incidence of tuberculosis in Malta as reflected by the notification rates compares more than favourably with that of other countries. This should not encourage complacency; notification rates generally do not reflect the *actual incidence* of the disease, more because of under- than of over-notification, and Malta is no exception (Reports on the Health Conditions of the Maltese Islands, 1965 to 1970). Although notification rates may not be a very reliable index of tuberculosis control, notification of new cases still plays an essential part in the control and eventual eradication of the disease because it leads to the examination of contacts and to the discovery of fresh cases, generally at an early stage of the disease. This (examination of contacts) still needs special provisions as it can easily be pushed aside in a busy general practice (Springett, 1971).

The present local mortality rate is a source of satisfaction and is better than that of most countries, in fact it is next best to the Scandinavian countries, leaders in this field. But what has been said about failure of notification of new cases of tuberculosis can well apply to death certification. The mortality rate which was the best guide to the changes occurring in the tuberculosis situation before the introduction of anti-tuberculosis drugs, can no longer be used as a yardstick in assessing the situation because of the great reduction in the case-fatality rate.

While the mortality rate has lost all its importance as an index of tuberculosis control, the Tuberculin Index has become of increasing usefulness; it is from the "infected pool" that most of the cases of tuberculosis will develop in the future. The World Health Organization has recommended the percentage tuberculin positivity at age 14 years as the most useful index of the tuberculosis situation in a community: tuberculosis would cease to be a public health problem when the rate of infection at the age of 14 as measured by the Tuberculin Skin Test falls to 1%.

The infection rate has certainly decreased in Malta, but to what extent remains to be proved by assessing the local significance of the Heaf grade 1 response. Present indications suggest that infection rate in children of 12-14 years is certainly lower than 20.4%, and perhaps nearer to 6.6%, but it is still far from the 1% required by World Health Organization standards.

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