Screening and management of tuberculosis in immigrants: the challenge beyond professional competence

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SUMMARY

SETTING: Right of entry may sometimes be denied to immigrants because of the threat of tuberculosis. During 1990–2000 some 1,050,000 immigrants, mostly from countries highly endemic for TB, arrived in Israel, a low prevalence country. Nevertheless, TB rates in Israel have remained low.

OBJECTIVE: To emphasise the challenge beyond technical competence for TB control for immigrants from the perspective of Israel’s National Tuberculosis Programme (NTP).

MATERIALS AND METHODS: We defined criteria for an NTP geared to immigration, and analysed our implementation of the European Task Force recommendations on international migration and TB control. We interviewed immigrants and health care workers to identify barriers to diagnosis, prevention and treatment of TB among immigrants. We used classical epidemiology to evaluate the impact of immigration on TB rates in the host population.

RESULTS: Until now there has been no evidence of significant spread of TB from immigrants to the host population. Successful outcome of treatment has been noted in over 75%, although a sub-population of immigrant substance abusers is proving more difficult to treat.

CONCLUSIONS: The risk of TB for the host country is very low and it seems possible to enhance TB control in immigrants with measures designed to address their cultural needs.

KEY WORDS: tuberculosis; TB control policy; tuberculosis epidemiology; immigration; Israel

MIGRATION (to move from one country, place or locality to another)* is a phenomenon that goes back to the roots of mankind. It is prompted by sociological, economic, political, psychological or religious motives. Host countries react to immigrants in different ways, ranging from encouragement and support to rejection and deportation. Denial of entrance to immigrants is sometimes ‘justified’ by invoking the threat of disease.

It is estimated that one third of the world’s population is infected with TB, and most new TB cases occur in developing countries. This explains why TB rates among foreign-born persons coming from high prevalence countries (mainly developing countries) and migrating to low prevalence countries (mainly industrialised countries) are two to 30 times higher than those of the native-born population.

Tuberculosis among immigrants is a complex issue: there are numerous difficulties, ranging from the logistics of screening to ethical problems dealing with societies and political regimes. Technical problems and the low efficacy of screening methods have been described in several countries—the screening of all asylum seekers entering Switzerland, the screening of immigrants in England, and the relatively low yields of active TB found in post arrival screening of immigrants in USA. Poor access to care and treatment outcome in foreign-born persons due to socio-cultural barriers, anti-immigrant sentiments and legislation and fear of deportation have also been partly addressed. In 1994 the European Task Force made recommendations for the control of TB in the foreign-born for use in European countries, and a similar set of recommendations for use by state and local health departments was developed in the United States in 1998.

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experience in Israel, a low TB endemic country\textsuperscript{11} that has been dealing with mass immigration, often from high TB endemic countries, since it became an independent state in 1948.

At the end of 2000, more than 30\% of Israel’s current population of 6.37 million was foreign-born, and only 27.8\% of Israeli Jews living in Israel had a father who had been born in Israel.\textsuperscript{12} During the period 1990–2000, some 1 050 000 new immigrants (847 600 from the Former Soviet Union, FSU) made their home in Israel.\textsuperscript{12}

In this article we will analyse, from the perspective of a National Tuberculosis Control Programme (NTP), four major issues: 1) What are the demands on the NTP in the context of immigration? 2) What are the barriers to diagnosis, prevention and treatment of TB among immigrants that need to be identified by the host authorities? 3) What is the potential spread of the disease to the host population? 4) What could be an overall strategy for an NTP in the context of mass immigration from endemic countries?

Migration and immigrants in Europe in general, and in Israel in particular

In the last decades of the 20th century, voluntary migration patterns changed, particularly within Europe, as Western European countries partly replaced the traditional immigration destinations such as the USA, Canada, Australia and New Zealand.\textsuperscript{13} In the 19th and early 20th centuries, Europe was primarily a region of emigration,\textsuperscript{14} and after World War II, guest workers were recruited from Mediterranean countries to meet the growing economic, industrial and production needs in Western Europe.\textsuperscript{14} When, in the mid-1970s, recruitment of temporary workers was discontinued, immigration continued due to family reunification schemes and asylum requests.\textsuperscript{14} Since the end of the 1980s, 2 million immigrants have entered Western Europe annually (i.e., five immigrants per 1000 population).\textsuperscript{13} Germany absorbed most of the legal immigrants and asylum seekers when the Ausländer from East Germany or Eastern Europe automatically became German citizens with the changes in German legislation in 1992. However, illegal immigrants have come mostly from developing countries.\textsuperscript{13}

The pattern of migration in Europe changed fundamentally after the fall of the Berlin Wall in November 1989, followed by the remarkable changes in Central and Eastern Europe (CEE) and the FSU, and the recent disintegration of former Yugoslavia.\textsuperscript{13} These events had a direct impact on immigration to Israel. In 1990 alone, some 450 000 people left the FSU, among them some 200 000 Jews, most of whom came to Israel.\textsuperscript{14}

Israel has very specific immigration characteristics compared to other countries with high rates of immigration. Since 1948, the population has grown sevenfold, from some 872 000 to more than 6.3 million at the end of 2000.\textsuperscript{12} The reasons for this are several waves of immigration from more than 100 different countries, a relatively high birth rate and a low mortality rate.\textsuperscript{15}

There are crucial historical and legal differences between the notion of immigration in Europe (except for Germany) and that in Israel regarding the acceptance of immigrants: a ‘law of Return’.\textsuperscript{16} Until recently, Israel and Germany were the only two countries in the world to have this kind of law. In Israel, every Jewish person or child or grandchild of Jewish descent who wishes to ‘return home’ to Israel, is eligible for immediate Israeli citizenship and full coverage under the National Health Insurance Law. In addition, there are thought to be some 200 000 foreign workers in Israel today, approximately half of whom are undocumented workers. These additional immigrants can apply for Israeli citizenship, but it is rare for it to be granted, a similar situation to that prevalent in most European countries today. Since the mid 1980s, several immigration waves from Ethiopia have brought to Israel almost the whole of a black Jewish community (the Falashas or Beta Israel, known in Israel as the Ethiopian Jews), together with the Falashas converted to Christianity (known in Israel as the Falash moura).\textsuperscript{17} The latter continue to immigrate, bringing the total number of immigrants from Ethiopia at the end of 2000 to some 63 000 (unpublished data, Ministry of Absorption).

Epidemiological background of TB in modern Israel

In 1948, Jewish immigration from the Arab countries and Eastern Europe (mostly survivors of the Holocaust) caused the incidence of TB to rise from some 50 cases per 100 000 to more than 210/100 000 in 1950.\textsuperscript{18} Energetic measures to treat the disease and improve socio-economic status caused a dramatic decrease in the incidence, which reached a low of 5/100 000 in 1990.\textsuperscript{19} However, immigration has continued to be the major risk factor for TB in Israel. In 1999, while only 30\% of Israeli citizens were foreign-born, 86\% of TB patients in Israel were of foreign origin, the highest proportion in the World Health Organization [WHO] European Region.\textsuperscript{19} Foreign-born cases comprise more than 40\% of TB cases in only nine of the other 51 WHO European Region countries (Denmark, Iceland, Luxemburg, Monaco, Netherlands, Norway, Sweden, Switzerland and the UK).\textsuperscript{19} Despite this, TB rates in Israel have remained low (8.5/100 000 and 4/100 000 for the veteran population), and Israel was one of the 22 countries in the WHO European Region with an incidence rate lower than 20/100 000.\textsuperscript{11,19}

MATERIALS AND METHODS

Our definition of the demands on an NTP in the context of immigration is personal, and based on a
combination of professional skills in the fields of public health, cultural anthropology and infectious disease, together with our experience with this issue over the past decade. We were also influenced by our exposure to colleagues from 51 countries in Europe who meet annually at the Wolfheze workshop for NTP managers, organised by the Royal Netherlands Tuberculosis Association (KNCV) and sponsored by the WHO and the International Union Against Tuberculosis and Lung Disease (IUATLD).

Concerning the specific objective of the host country authorities ‘to identify the barriers to diagnosis, prevention and treatment of TB among immigrants’, we reviewed the social science literature on the problem of non-compliance and the failure of health-care providers to account for cultural differences in the perception of disease and how to cure it. In 1997, over a 5-month period we interviewed 12 Ethiopian families ranging in size from two to 13 members, three traditional healers and 21 Israeli health and absorption professionals. These were formal anthropological interviews performed throughout the country, in both absorption centres and permanent settlements. Informal interviews were also conducted with several guests at the homes of the Ethiopian subjects.

In the evaluation of the outcome of our new overall strategy, we evaluated the potential spread of tuberculosis to the host population. Using classical epidemiological methodology we performed a retrospective cohort analysis of all TB notifications for 1987–1999 by country of birth. TB rates by annual cohort were calculated among immigrants from endemic countries (Ethiopia and the FSU) and their impact on the overall incidence of TB was assessed. The TB rates for 1987–1989, during which there was no mass immigration, were used for comparison. We also carried out a preliminary analysis of the molecular epidemiology of TB in Israel in recent years using standardised methodology. IS6110-RFLP typing was performed on 151 strains from individuals notified with TB in 1997–1999 and compared with the results of 55 individuals with pulmonary TB notified in 1992–1996 before the new Israeli NTP, launched in 1997.

Using the recommendations of the 1994 European Task Force, we combined public health and social sciences skills to establish an overall strategy for an NTP in a low TB endemic country in the context of mass immigration from high TB endemic countries. In this paper, we evaluate to what degree the European recommendations are actually addressed by the Israeli NTP.

**RESULTS AND DISCUSSION OF THE FOUR MAIN ISSUES**

**Implementation of the four main principles in the Israeli NTP**

In order to guarantee efficient TB control we centralised the delivery of TB care to nine regionally distributed designated centres according to the location of the cases registered at the Ministry of Health (MOH) TB registry and to the accessibility of the health services. For Ethiopian immigrants, District Health Office (DHO) physicians and public health nurses implement a series of screening (active case finding) and vaccinating procedures directly at the absorption centre. For all other immigrants, we rely on passive case finding.

All immigrants, both Israelis and non-Israelis, receive TB treatment free of charge. Translation is provided when language difficulties are encountered. Work at the TB centres is monitored by the local DHO using a bi-weekly meeting of the staffs as a vehicle of coordination. New immigrants from Ethiopia are housed in absorption centres until permanent housing can be provided. This preserves some of the cultural background that is lost when they eventually disperse to their permanent place of residence. Other immigrants are usually met by relatives who are familiar with the organisation of all aspects of absorption of new comers, including access to health care by membership in one the four Health Medical Organisations (HMO) which operate under the National Health insurance plan.

Immigrants are greeted on arrival at the international airport near Tel Aviv; all administrative issues are addressed on the spot by the ministries of absorption and the interior. This approach eliminates many of the potential barriers to access to TB care, because enrolment in the four HMO health care providers is also provided on the spot. The fact that new immigrants often present for TB evaluation within days of arriving is probably due to this measure.

Politically, Israel is geared to the absorption of immigrants, and health care providers are expected to cater to the specific health needs of new immigrants. To inform decision-makers adequately, and to prevent them from being influence by unjustified fears, it is of particular importance to elaborate rational arguments based on data gathered by traditional epidemiological means (see below). The MOH Department of TB and AIDS, which was created predominantly to deal with the influx of both diseases from high prevalence countries, is active in presenting such data to the relevant committees of the Parliament (Knesset), and obtaining legislative and financial support for its National Control Programmes. Traditional public health and sociological arguments brought before these committees have defused potential xenophobia related to immigrant related health issues. We followed the recommendation of Gellert, who suggested that ‘interpretation of communicable disease data should occur in an atmosphere that is non-punitive, with clear public health objectives stated, and assurances of confidentiality and non-discrimination’.

The contingency plans for the new NTP originated in the deliberations of the advisory committee to the
Director General of the MOH for TB. The unique approach to TB control for new immigrants described in this paper was developed in collaboration with this committee.

**Anthropologic and sociologic differences in immigrant populations**

This often neglected but important aspect of TB control in immigrant populations depends on the will and awareness of the host authorities to identify, delineate and eventually overcome barriers to diagnosis, prevention and treatment of TB in these populations. To ensure the successful and humane absorption of immigrants, attention must be paid to this issue.

A checklist first developed for hepatitis B and human immunodeficiency virus (HIV) infections was further developed to successfully facilitate the cultural aspects of TB control. We systematically reviewed the adequacy of health facilities, provided funds for transportation and addressed attitudinal barriers stemming from discrimination on racial or other grounds capable of dissuading patients from seeking treatment.

In addition, we argue, as do others, that it is relevant to incorporate this approach in any public health programme for TB, and to enlist the help of social scientists as early as possible in the design of the programme. We focused on the needs of the target population and not, as often inadvertently occurs, those of the provider.

On studying anthropological aspects of TB among our immigrants from Ethiopia, we discovered that they had no standard term for tuberculosis. Thus, when we asked a translator to inform a patient in Amharic that he had TB, he would be told that he had ‘yesamba nekersa’ (lung cancer) or ‘yesal beshita’ (a common cold). In both instances, the TB treatment recommended, at least 6 months of a number of pills daily, was (justifiably) inappropriate from the patient’s point of view. This led us to use the Hebrew term ‘Shachefet’ when discussing TB with Ethiopian patients, a ‘new’ word for a ‘new’ disease requiring treatment, which was also ‘new’ or ‘different’ to what they had been used to in their home country.

The large cultural gaps between the immigrant and host countries will inevitably require adaptation by the immigrant as part of the integration process. We concomitantly changed the integration apparatus to deal with the cultural needs of our immigrants. This was often a spontaneous, pragmatic process in response to difficulties arising in the field, and not a prospective preordained procedure. We did, however, sometimes conduct a structured dialogue with immigrants and health care workers in planning and implementing the programme, and tried to avoid a paternalistic approach as much as possible. We did not succeed in involving the target population in playing an active role in health promotion and the NTP, which would have been ideal. However, the training of Ethiopian health care workers in AIDS and TB may be seen as surrogate empowerment of some individuals and through them the community as a whole to assume greater responsibility for their health promotion.

In addition to anthropological surveys on health issues conducted by social scientists, health professionals themselves can also rapidly assess the needs of difficult individual patients or groups. For example, we discovered that our TB nurses viewed the interventions of welfare social workers regarding TB patient adherence using a simple questionnaire to be ineffective.

**Evidence of lack of spread of TB from recent immigrants**

One of the main concerns of a host nation is the threat of spread of TB from immigrants to the host population. The rationale for NTPs stems in no small degree from the perceived need to contain and minimise such spread. We examined the impact of mass immigration from Ethiopia (TB rates 1–3%) and the FSU (40–150/100 000) on the incidence of TB in veteran residents of Israel during the years of massive immigration (1990–1999) (Figure 1). Despite the rise in the absolute number of active TB cases in veteran Israelis, when rates were calculated they had not significantly increased despite the influx of TB from Africa and Eastern Europe (Figure 2). The rate of TB remained low, at around 4–5/100 000, and quite stable among the veteran population. Using restriction fragment length polymorphism (RFLP) analysis we found that most cases of active TB were due to reactivation strains native to their country of origin. In a cluster of cases in a boarding school, RFLP evidence was suggestive of transmission of disease within the school, and we anticipate using it to determine the degree of transmission from immigrants to the veteran population, as studied by others.

Our observation that there has been no impact of massive immigration from hyper-endemic TB areas on the host population of this low prevalence country

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**Figure 1** Tuberculosis incidence rate by annual cohort of immigration from the Former Soviet Union, Israel 1987–1999 (rate/100 000).
is in line with other studies in Hawaii and Australia. It therefore seems that the risk of TB for the host country is very low.

The non impact of immigration (at an overall population rate, not at an individual level) from high prevalence to low prevalence areas is not surprising, given that tuberculosis is not easily transmissible. In a country of low prevalence such as Israel, only ‘high risk’ populations are in fact exposed to a sufficient amount of *Mycobacterium tuberculosis* to be newly infected. Furthermore, the extent of interaction between new immigrants and the veteran population is limited in Israel during the initial period after arrival of the immigrants, particularly those living in absorption centres where most new immigrants from sub-Saharan Africa are first housed on arrival. During this period of semi-isolation, we employ active case finding (and treatment) on arrival for these immigrants. As a result, the combination of limited contact with the host population and early treatment of active disease considerably reduces the risk of TB transmission.

We also try to prevent possible reactivation of TB by offering directly observed treatment of latent TB infection in children and most immigrant adults in absorption centres.

We also employ active HIV case finding in this high-risk group. Between 1990 and 1998, this group of immigrants represented 47% of all new HIV/AIDS cases and some 30% of all new TB cases notified in Israel. Lastly, treatment success is above 75%, compared to 27% before the TB services were boosted to cope with immigration. There is, however, a sub-population of alcoholic and injecting drug users, including many former prison inmates from the FSU, who are proving particularly difficult to treat.

**Provision of comprehensive curative and preventive services to treat TB among immigrants**

There is a need to plan and provide comprehensive curative and preventive services for TB while providing ad hoc solutions as needed. The recommendations of the special European Task Force and those from the USA uphold the principals enunciated above. Israel has had variable success in applying these principles, as may be seen in the Table. Except in rare instances, Israel did not have a pre-immigration TB screening programme such as in Australia, Canada and the USA. According to MOH directives, there is a screening programme for both TB and HIV for immigrants from sub-Saharan Africa on arrival because of the high yield for these diseases, which are endemic in their country of origin (for TB since 1988, and for HIV since 1991). Since 1997, free hospitalisation and ambulatory DOTS (directly observed therapy, short-course) for all cases is provided for all citizens. TB treatment, including hospitalisation, is

**Table 1994 European Task Force recommendations and their degree of implementation in Israel**

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Degree of implementation</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification system</td>
<td>Highly satisfactory</td>
<td>Epidemiological analysis by citizenship and by country of birth; computerised network, soon to be on line</td>
</tr>
<tr>
<td>Consider screening of high incidence/prevalence groups</td>
<td>New immigrants from Ethiopia: active case finding (and start of supervised treatment) (MOH, 1991)—highly satisfactory New immigrants from FSU: passive case finding is globally efficient Documented foreign workers: mandatory TB screening has been included in the Law of Employment Service</td>
<td>Still need full implementation and evaluation</td>
</tr>
<tr>
<td>Cultural and social services to implement intervention</td>
<td>Exist for some population groups</td>
<td>Need to be extended to other groups* (e.g., undocumented foreign workers)</td>
</tr>
<tr>
<td>Provision of curative and preventive TB services</td>
<td>Fully implemented, included for non-Israeli immigrants (MOH budget)</td>
<td></td>
</tr>
<tr>
<td>Ongoing evaluation of screening procedures</td>
<td>Done for documented immigrants* Does not exist for undocumented immigrants</td>
<td></td>
</tr>
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</table>

* To systematically address the need of ‘hard to reach’ population, we are in the process of building social services in addition to those existing for documented new immigrants.

* Screening procedures are evaluated on an ongoing basis for immigrants from sub-Saharan Africa and are also addressed at regular intervals by the MOH’s TB Advisory Committee.

MOH = Ministry of Health.
also provided for uninsured tourists and foreign citizens, and is covered by the Israeli MOH.11

As with all TB patients, adherence to treatment is an important problem.29 We have previously described barriers to treatment in immigrants compared to local patients.29 Health professionals frequently blame the patient, but in fact inadequate TB facilities are often the causes of non-completion of treatment.28

In addition to the NTP,11 we have adopted a series of ad hoc solutions allowing diagnosis and treatment of TB cases among undocumented residents and their close contacts: undocumented residents are entitled to receive emergency treatment without notifying the immigration authorities.46,47 After the diagnostic phase, these patients receive DOTS similar to that given to the local population. If they do not have insurance, the MOH will cover the costs of hospitalisation. Treatment of active disease and contact investigation is as for all other TB patients. Recently, an updated ‘Foreign Workers Law’48 and ‘Employment Service Law’44 were passed, providing for screening of documented foreign workers in their country of origin.

CONCLUSION

It is a challenge for health professionals to develop and guarantee an efficient and egalitarian TB control policy among immigrants. We are aware that our attempt to implement the recommendations of the European Task Force,2 including the provision of curative and preventive TB services for all TB patients regardless of their immigrant status, has many features unique to our large burden of immigration. Nevertheless, part of the experience and approach presented in this article could be relevant for other low TB prevalence countries confronted with immigration from highly endemic countries, a situation not uncommon in Western Europe and North America today.

Acknowledgements

We gratefully acknowledge the aid of the health care professionals who are implementing the NTP with so much energy and devotion, on behalf of their TB patients and families.

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The opinions expressed in this article are those of the authors and do not purport to represent the opinions of the agencies with which they are associated.

References


CADRE: Il arrive que le droit d’entrée soit parfois refusé aux immigrants par crainte de la tuberculose. Au cours des années 1990–2000, quelques 1 050 000 immigrants, provenant pour la plupart de pays à forte endémie de tuberculose, sont arrivés en Israël, pays à faible prévalence. Néanmoins, les cas de TB en Israël restent peu nombreux.

OBJECTIF: Analyser les défis concernant le contrôle de la TB chez le migrant, au-delà des aspects techniques, dans le contexte du Programme National TB (PNT) d’Israël.


RÉSULTATS: A ce jour, il n’y a pas eu de preuve d’une propagation significative de la TB parmi la population d’accueil à partir des immigrants. Le traitement a eu un résultat couronné de succès dans plus de 75%, bien qu’un sous-groupe d’immigrants narcotiques se soit avéré plus difficile à traiter.

CONCLUSIONS: Le risque de TB pour le pays d’accueil est très faible, d’autant qu’il semble possible de renforcer la lutte anti-tuberculeuse chez le migrant par des mesures visant à s’adapter à leurs besoins socio-économiques.

RESUMEN

CONTEXTO: A veces el derecho de entrada al país puede ser negado a causa de una amenaza de tuberculosis (TB). Durante los años 1990–2000, llegaron a Israel, un país de baja prevalencia, cerca de 1.050.000 inmigrantes, la mayoría provenientes de países donde la TB es altamente endémica. Sin embargo, las tasas de TB en Israel siguen siendo bajas.

OBJETIVO: Enfatizar el desafío que significa el control de la TB en los inmigrantes, más allá de las competencias técnicas, desde la perspectiva del Programa Nacional de TB (PNT) de Israel.

MATERIAL Y MÉTODOS: Se definieron los criterios para un PNT adaptado a la migración y se analizó su implementación de las recomendaciones de la European Task Force sobre la migración internacional y el control de la TB. Se entrevistaron inmigrantes y trabajaba-
dores de la atención de salud para identificar las barreras que dificultan el diagnóstico, la prevención y el tratamiento de la TB en los inmigrantes. Se utilizaron los métodos epidemiológicos clásicos para evaluar el impacto de la inmigración sobre las tasas de TB en la población huésped.

RESULTADOS: Hasta ahora no hay evidencias de una transmisión significativa de la TB de los inmigrantes hacia la población huésped. Se ha constatado un resultado exitoso del tratamiento en más del 75%, a pesar de que un subgrupo de inmigrantes utilizadores de drogas haya sido más difícil de tratar.

CONCLUSIÓN: El riesgo de TB para el país huésped es muy bajo y parece posible reforzar el control de la TB en los inmigrantes con medidas diseñadas para enfrentar sus necesidades culturales.