

Globalization of tuberculosis

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After 30 years of decline, the annual incidence of tuberculosis (TB) in Canada has remained at about 7 per 100 000 population since 1987.¹ But global rates of TB are rising, especially in regions of Africa, Asia and Latin America, where co-infection with HIV and *Mycobacterium tuberculosis* is common.² Estimates for 1990 of TB incidence, which take into account underreporting, were 237 per 100 000 in Southeast Asia, 191 in Africa and 127 in Latin America.² About 95% of the 8 million cases reported annually occur in the developing world. Of these patients, 5 million receive some treatment, but only 0.5 million receive curative directly observed therapy, short course.³ Most of the new cases arise as reactivation in the 1.7 billion people (one-third of the global population) estimated to have been infected with *M. tuberculosis*.

Over the past 12 years the number of immigrants to Canada each year has more than doubled, from 84 302 in 1985 to the current level of about 250 000.⁴ At the same time, the predominant places of birth of these new Canadians has shifted substantially. Europe was the major source in the 1960s, whereas Asia and increasingly Africa and Latin America, regions with high rates of TB, have been the major sources in the 1990s.⁴

Close to half of these new Canadians choose to live in Ontario, about 20% in Quebec, another 20% in BC and about 8% in Alberta.⁵ Urban centres are the most common destinations. In 1993 Toronto received 28.0% of all immigrants, Montreal 15.0%, Vancouver 14.6% and Calgary 3.4%; the remainder located mainly in other urban centres across the country.

The natural history of TB begins with infection during youth. This infection becomes dormant in 90% of cases. Among the other 10% of cases, active, symptomatic disease develops immediately in half, and reactivation occurs later in life in the other half. Hence, the chest radiography screening of applicants over the age of 10 years that is required by Immigration Canada eliminates people with currently active pulmonary TB but does not identify those with an infection that might reactivate later. It is therefore not surprising that the epidemiology of TB in Canada increasingly reflects patterns of immigration in terms of not only the countries of origin of the immigrants, but also their chosen destinations. During the past decade, rates of TB among Canadian-born residents have continued to decline, from 1274 cases in 1985 to 775 cases in 1995. On the basis of the population in the midpoint census year of 1991, this represents a decline in annual incidence from 5.4 to 3.3 per 100 000. During the same period, the number of cases among foreign-born residents rose from 859 to 1116, an increase in annual incidence from 18.8 to 24.4 per 100 000 (on the basis of the population in the 1991 census year).

Two papers in this issue examine the population-based epidemiology of TB in the early 1990s, one reporting data for southern Alberta (page 599) and the other for the island of Montreal (page 605). The annual incidence of disease was lower in southern Alberta (5.8 per 100 000) than in Montreal (11.2 per 100 000). The contribution represented by cases among foreign-born residents was similar in the 2 regions: 70.6% in southern Alberta (annual incidence 25.8 per 100 000) and 77.3% in Montreal (annual incidence 37.5 per 100 000). The percentage contribution of cases among foreign-born residents to the TB burden in these 2 regions was slightly higher than the overall contribution of such cases in Canada for 1995 (57.8%).¹ Foreign-born residents constitute only 15% of the Canadian population. Thus, their rate of TB is 4 times that expected for their numbers in the population.



Editorial

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‡ See related articles pages 599
and 605



In southern Alberta the mean period between arrival in Canada and diagnosis was 11.2 years (median 7 years). The median time to diagnosis was shortest for cases of lymph node disease (about 5 years) and longest for cases of pulmonary disease (6.0 years for Asian-born immigrants and 14.5 years for those from other regions). In Montreal 33.2% of the foreign-born residents with TB presented within 2 years of their arrival in Canada and 56.3% within the first 5 years. These data suggest an earlier onset of disease in Montreal than in southern Alberta. Among the Montreal cases, 66.3% were pulmonary, whereas in southern Alberta foreign-born residents had more extrapulmonary disease, especially those originating from Asia (61.0%). In the Montreal population, 8.7% of patients had isoniazid resistance, but there was no substantial difference in the level of resistance to this drug between foreign-born and Canadian-born residents. Given the increasing rates of drug resistance in the developing world,⁶ Canadians should anticipate a concomitant increase in resistance among residents born outside of Canada. In 1993–94, resistance to antituberculous drugs in western Canada occurred in 6.9% of cases,⁷ a level that had not increased since 1963.⁸

The authors of both papers remind Canadian clinicians whose experience with TB is infrequent of the need for a high index of suspicion of the disease for those born in countries where TB is endemic and who present early or late after arrival in Canada with symptoms of cough, fever, weight loss or unexplained infection in an extrapulmonary site. The diagnosis depends on considering TB in the differential diagnosis and submitting appropriate specimens for culture. Initiation of prompt, appropriate drug treatment and assurance of completion of therapy is possible when a strong public health program for TB control operates collaboratively with treating physicians.

Citizenship and Immigration Canada, which has been subject to significant cutbacks and pressures to expedite economically lucrative immigration, will have difficulty maintaining its hitherto effective program of screening immigration applicants by chest radiography. In the past, Canadian TB control programs have had committed dollars, clear guidelines, diagnostic and clinical networks, supervised drug treatment (known as directly observed therapy) and centralized reporting and evaluation, and these programs have served well to contain TB in this country. However, health care restructuring is now putting these systems at risk.

Opportunities for prophylaxis of immigrants from countries where TB is endemic, as suggested by Cowie and Sharpe (page 599) and others,⁹ would be a costly endeavour necessitating a system to identify reactors on ar-

rival.¹⁰ Such a system might be cost effective if it were linked to a broader early health intervention strategy for newcomers in need of immunization and orientation to the Canadian health care system.

However, no amount of screening before immigration to Canada or prophylactic treatment of newcomers upon their arrival will contain TB rates unless an aggressive approach is taken to controlling the global epidemic, an approach in which Canada should be an active contributing participant. A recent national consensus conference on TB, hosted in Toronto by Health Canada's Expert Committee on Tuberculosis, recommended "an urgent evaluation of current policies and strategies." Targeted funding of nationwide programs in the developing world has contained the rising rates of TB in about 15 model countries, even in the face of the HIV epidemic.³ However, determination to maintain these programs is severely threatened by the global imperatives of cost containment. In the future, TB epidemiology in Canada will reflect the impact of health sector reform and cost-cutting both here and abroad. Canada's recommitment to support strengthened TB control globally will not only save lives abroad, but in the longer term will also protect Canadians from TB resurgence in this country.

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