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## Multi-drug resistant tuberculosis in the Netherlands

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## b | Antituberculosis-Drug Resistance

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### To the Editor:

The report by Pablos-Méndez et al. pointing out the alarming worldwide threat imposed by multidrug-resistant tuberculosis prompts us to comment on the clinical, social, and financial impact of this problem.

We studied the outcome of treatment in 30 consecutive patients (19 male and 11 female) with multidrug-resistant tuberculosis who were referred to our tertiary care tuberculosis unit between 1985 and 1996. The mean age was 34 years (range, 15 to 82); none of the patients were HIV-seropositive; and 23 were foreign-born. The majority (27 patients) had pulmonary tuberculosis, typically with apparently active disease. All patients were culture-positive on admission, with strains that were resistant to isoniazid and rifampin (by definition), but streptomycin resistance was present in strains from 20 patients, and resistance to both pyrazinamide and ethambutol was present in strains from 5 patients. In 17 patients, previous tuberculosis treatment was documented, and 10 patients were known to have had no prior treatment. Twenty-seven patients with pulmonary tuberculosis had smear-positive sputum samples. Smears of sputum samples from most of these patients converted to negative within eight weeks, but four converted to negative only after a median period of two years. Inpatient treatment lasted a mean of 173 days (range, 31 to 481).

Patients were treated with seven drugs on average. Side effects were common, as were language and cultural barriers between patients and care providers. Yet compliance was high, with directly observed chemotherapy during in-patient treatment. Tuberculosis treatment was continued until six months after the conversion of sputum cultures; one patient received additional surgical treatment for the control of tuberculosis, and two others underwent surgery for aspergilloma after successful tuberculosis treatment. The estimated cost of treatment (including the cost of drugs and the admission fees) was \$60,000 per patient. The mean length of follow-up was 2053 days (range, 497 to 3892); none of the patients were lost to follow-up. Patients were considered cured if the clinical response was favorable and if cultures and directly obtained smears remained negative after the completion of treatment. Six patients died, three with active tuberculosis and three of unrelated conditions. Our results compare favorably with the results of Goble et al.<sup>1</sup> but are similar to those for patients without HIV in the studies by Park et al.<sup>2</sup> and Telzak et al.<sup>3</sup>

The costs of treating multidrug-resistant tuberculosis are tremendous, both economically and in terms of human suffering, although in affluent societies the mortality rate may have been overestimated in the past. Pablos-Méndez et al. rightly call for increased global efforts to combat the effects of poor tuberculosis-control programs, especially in developing countries.<sup>4</sup>

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