



# Importance of Public-Private Mix Collaboration in Tuberculosis Control: It Is Also Valuable in Patients with Multidrug-Resistant Tuberculosis

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Although tuberculosis (TB) is a curable and preventable disease, it is a global health concern; approximately 10.0 million new cases and 1.4 million deaths were reported worldwide in 2019<sup>1</sup>. Moreover, rifampin-resistant TB and multidrug-resistant (MDR) TB are a public health threat, accounting for approximately half a million cases worldwide in 2019<sup>1</sup>. However, over the past decades, the management of MDR/extensively drug-resistant TB has been challenging because of long treatment duration (up to 24 months), adverse drug reactions, expenses, and low treatment success rates<sup>2,3</sup>. In South Korea, although the incidence of both drug-susceptible and drug-resistant TB has been decreasing over the past decade, the incidence of TB is higher than that reported in other countries with a similar economic status<sup>4</sup>. Moreover, treatment outcomes in patients with MDR-TB in South Korea are not satisfactory. In a large multicenter cohort study conducted from 2000 to 2002, the treatment success rate was low (45%) and a high proportion of patients were lost to follow-up (32%)<sup>5</sup>. In Korea, since the main cause of unfavorable outcomes in patients with MDR-TB is a loss to follow-up, a stricter TB control program is required. The public-private mix (PPM) collaboration, implemented in 2007, has been shown to be effective in TB control in terms of increasing the treatment success rates

and decreasing the loss to follow-up rates<sup>6</sup>.

In this issue of the journal, Kang et al.<sup>7</sup> evaluated the impact of the PPM collaboration on MDR-TB control by comparing the treatment outcomes in patients with MDR-TB before and after the implementation of the PPM collaboration. Of 176 patients with pulmonary MDR-TB, 128 patients (72.7%) were successfully treated; the treatment success rate was significantly higher in the post-PPM period than in the pre-PPM period. Moreover, the loss to follow-up rate was significantly lower in the post-PPM period than in the pre-PPM period. The authors concluded that the improvement in treatment outcomes in patients with MDR-TB is potentially linked to implementation of the PPM collaboration, primarily due to the decrease in the loss to follow-up rate.

Patients who are lost to follow-up could have higher risks of a second chance of lost to follow-up, MDR-TB, and mortality<sup>8-10</sup>. Therefore, management of such patients is very important in TB control in terms of increasing treatment success and decreasing TB transmission. The PPM collaboration could play an important role in controlling these problems through close monitoring of patients with TB by monitoring treatment compliance and adverse drug reactions and providing education and counselling. The study by Kang et al.<sup>7</sup> shows the positive results of the PPM collaboration in treatment of patients with MDR-TB, indicating the importance of the PPM collaboration covering all hospitals treating patients with TB and providing comprehensive support to patients with TB.

MDR-TB is a growing problem worldwide due to a lack of effective drugs, long treatment duration (up to 24 months), adverse drug reactions, costs, and low treatment success rates<sup>3</sup>. Of these problems, the lack of safe and effective drugs together with the frequent development of adverse drug reactions can result in worse outcomes<sup>11</sup>. Shortening the duration of MDR-TB treatment can improve treatment compliance, decrease side effects, and reduce costs; the resultant increase in treatment success rates would be a big advancement in TB control. Therefore, novel drugs that are effective and safe against *Mycobacterium tuberculosis* are required to reduce the number

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of drugs administered and the duration of treatment in both drug-susceptible TB and MDR-TB. Bedaquiline and delamanid are the most promising novel drugs for the treatment of MDR-TB as they have shown high efficacy and tolerability<sup>11</sup>. In the study by Kang et al.<sup>7</sup>, the use of these two drugs was a positive predictive factor for successful treatment outcomes. Therefore, proper use of these two new drugs in combination with the PPM collaboration could improve treatment outcomes in patients with MDR-TB. However, development of every new TB drug is eventually followed by the evolution of drug-resistant *M. tuberculosis*<sup>2</sup>. Therefore, efforts to reduce the development of resistance to valuable new TB drugs are also warranted.

## Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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