

Management of children exposed to *Mycobacterium tuberculosis*: a public health evaluation in West Java, Indonesia

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Objective To investigate qualitatively and quantitatively the performance of a programme for managing the child contacts of adult tuberculosis patients in Indonesia.

Methods A public health evaluation framework was used to assess gaps in a child contact management programme at a lung clinic. Targets for programme performance indicators were derived from established programme indicator targets, the scientific literature and expert opinion. Compliance with tuberculosis screening, the initiation of isoniazid preventive therapy in children younger than 5 years, the accuracy of tuberculosis diagnosis and adherence to preventive therapy were assessed in 755 child contacts in two cohorts. In addition, 22 primary caregivers and 34 clinic staff were interviewed to evaluate knowledge and acceptance of child contact management. The cost to caregivers was recorded. Gaps between observed and target indicator values were quantified.

Findings The gaps between observed and target performance indicators were: 82% for screening compliance; 64 to 100% for diagnostic accuracy, 50% for the initiation of preventive therapy, 54% for adherence to therapy and 50% for costs. Many staff did not have adequate knowledge of, or an appropriate attitude towards, child contact management, especially regarding isoniazid preventive therapy. Caregivers had good knowledge of screening but not of preventive therapy and had difficulty travelling to the clinic and paying costs.

Conclusion The study identified widespread gaps in the performance of a child contact management system in Indonesia, all of which appear amenable to intervention. The public health evaluation framework used could be applied in other settings where child contact management is failing.

Abstracts in **عربي**, **中文**, **Français**, **Русский** and **Español** at the end of each article.

Introduction

Current efforts to control childhood tuberculosis are failing, with over 100 000 children dying from the disease globally each year.¹ Children under 5 years of age who are in contact with a patient with infectious tuberculosis are at an especially high risk of *Mycobacterium tuberculosis* infection and early progression to tuberculosis disease, which is characterized by the presence of symptoms.² However, disease progression can be halted using preventive therapy, which has a reported efficacy of up to 93%.³ The World Health Organization (WHO) recommends that children who come into contact with an individual with infectious tuberculosis undergo child contact management, which includes screening for tuberculosis disease and, for those younger than 5 years, 6 months of isoniazid preventive therapy, even if disease is ruled out.⁴ This strategy can greatly reduce childhood tuberculosis, yet it is rarely practised in endemic settings.

Although earlier research has identified barriers to the success of child contact management programmes, a focus on single barriers has hindered the development of comprehensive programmes.^{5–9} Previously we presented a public health evaluation framework that involved situational, gap and options analyses and that could be used to identify problem areas and to develop appropriate multi-targeted solutions.¹⁰ In this paper we present the findings of the first two stages of a public health evaluation carried out using this framework in Bandung, West Java, Indonesia. Indonesia has the fifth high-

est tuberculosis case load in the world¹¹ and reports indicate that a substantial proportion of tuberculosis patients in Java (i.e. 11 to 27%) are children.¹² We hypothesized that there are widespread gaps between actual and ideal performance across a range of child contact management system parameters.

Methods

The study was conducted between April 2009 and February 2012 at a community lung clinic in Bandung that diagnoses approximately 1500 adults with pulmonary tuberculosis annually. Of these adults, 50% test positive on sputum smear analysis. The clinic has sputum smear and mycobacterial culture facilities, a pharmacy and a paediatric clinic. Screening of household contacts of sputum-smear-positive tuberculosis cases is encouraged but is not subsidized for children.

Data were obtained from administrative records, staff and adult tuberculosis patients and their households. Informed consent was gained from all participants. Ethical approval was given by the Lower South Regional Ethics Committee, New Zealand, and the ethics committee of the Medical Faculty, Padjadjaran University, Bandung.

Performance parameters and indicators

We developed a number of parameters for assessing the performance of the child contact management programme at the clinic, each of which was associated with a performance indicator (Table 1). The targets adopted for each indicator were

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