EDITORIAL

Strategies to improve tuberculosis case finding in children

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The DOTS strategy focused on effective treatment of the most infectious sputum smear-positive tuberculosis (TB) cases in order to break the *Mycobacterium tuberculosis* transmission cycle. From an epidemiological perspective this remains a highly cost-effective intervention, but traditional DOTS-based approaches excluded children, as they are unable to expectorate and contribute little to ongoing transmission within communities.¹ However, as TB is a major cause of under-5 morbidity and mortality, there is a need to explore enhanced paediatric care delivery strategies in TB-endemic areas.² The study by Joshi et al. in this issue of *Public Health Action* is therefore highly relevant.³

The study assessed several community-based interventions to improve TB case detection in children. The combined impact of these strategies was tested in seven intervention districts using historic pre-intervention notification data and data from non-intervention districts as controls. In the intervention districts, the relative yield and number needed to screen to identify one TB case were compared for the following interventions; 1) screening household contacts of infectious TB patients, 2) linking private and public health services, 3) using mobile screening clinics, 4) home-based visits of households affected by the human immunodeficiency virus (HIV), 5) screening of children at school and 6) sensitisation of maternal and child health clinics to refer presumptive paediatric TB cases.

The fact that screening of school children yielded no new cases is not surprising, as children are generally at low risk of disease development during the so-called 'safe' primary school years.⁴ Although schools offer a captive audience for disease screening, school-based TB case-finding activities are unlikely to be cost-effective given the low yields. However, as adolescent children are at increased risk of developing adult-type TB, secondary school teachers should be encouraged to refer children with suspected TB symptoms for diagnostic assessment.⁵

Integration of TB case-finding strategies into maternal and child health services is essential, as this is where most young children with TB disease will present.^{1,6} Although active paediatric case finding integrated into safe motherhood services was not found to be productive in Nepal, this does not reduce the need for passive case finding among children with presumptive TB symptoms and restricted active case finding among those with recent TB contact. Visits to HIV-affected households were also found to be unproductive for TB case finding among children, although

such visits may serve other beneficial purposes that should be considered, such as adult TB case finding, assessment of patients' social circumstances and consideration of individualised HIV care options.

Of the more productive active case-finding strategies identified, the use of mobile screening clinics in highly vulnerable populations offered the best yield. Although the identification of children with presumptive TB was encouraging, the greatest value of mobile screening clinics is likely to be the identification of previously undiagnosed infectious adult (and adolescent) cases. Despite strong evidence of benefit from active outreach case-finding programmes in high-burden populations,⁷ TB control agencies have been slow to translate evidence from pilot projects into action. Identifying children with presumptive TB at the same time as adults with infectious TB are diagnosed provides additional motivation for widespread implementation of mobile screening clinics in vulnerable populations.

Constructive involvement of the private sector is important, particularly in South Asia, where private sector doctors are often the preferred primary service provider. In many countries TB care is an important source of income for private practitioners, providing an incentive for overdiagnosis and a disincentive to refer patients to the national TB programme. Although TB diagnosis and care should be free for all patients, potential perverse incentives require consideration. In the current study, the exact nature of the private-public interaction is unclear. The statement: '...costs of diagnosis in private facilities were reimbursed under the TB REACH programme' seems to imply that this occurred only when a TB diagnosis was made, providing a potential bias towards TB diagnosis. It is also unclear how private practitioners selected children for TB screening.

This leaves us with one of the most important and most neglected active case-finding approaches in TB endemic areas — household contact screening. It is a pity that the simplified World Health Organization-recommended approach for screening of household contacts,⁸ which does not require tuberculin skin testing or chest radiography in asymptomatic children, was not employed. Simplified symptom-based screening has been shown to be safe and effective in TB endemic areas, and would have been ideal for the Nepal setting.^{9,10} All close contacts of an infectious TB case (adults and children) should be screened for presumptive TB symptoms. Those with symptoms require further evaluation, while asymptomatic contacts

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should be encouraged to present to their local clinic if they develop symptoms suggestive of TB in the coming months/years. Importantly, asymptomatic contacts who are vulnerable to disease progression, such as children <5 years of age and immunocompromised individuals, should be offered preventive therapy. The current study did not provide preventive therapy, which is a major shortcoming. In terms of cost efficiency, household contact screening is the only intervention that offers the dual benefit of 'high yield' active case finding and the provision of preventive therapy to vulnerable individuals.

A final point of consideration is the need for accurate disease phenotyping in paediatric TB studies.¹¹ The vast majority of additional cases occurred among sputum smear-negative pulmonary TB and extra-pulmonary TB cases, without any description of the disease entities observed. An accurate disease description is important to appreciate the exact nature of the additional cases identified.

Despite its limitations, the study by Joshi et al. provides a clear demonstration of the added value of active case-finding strategies in children, emphasising the need for universal household contact screening, and provision of preventive therapy to all vulnerable individuals.¹²

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