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Regional initiatives to address the challenges of tuberculosis in children: perspectives from the Asia-Pacific region

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ABSTRACT

Increasing attention is being given to the challenges of management and prevention of tuberculosis in children and adolescents. There have been a number of recent important milestones achieved at the global level to address this previously neglected disease. There is now a need to increase activities and build partnerships at the regional and national levels in order to address the wide policy-practice gaps for implementation, and to take the key steps outlined in the Roadmap for Child Tuberculosis published in 2013. In this article, we provide the rationale and suggest strategies illustrated with examples to improve diagnosis, management, outcomes and prevention for children with tuberculosis in the Asia-Pacific region, with an emphasis on the need for greatly improved recording and reporting. Effective collaboration with community engagement between the child health sector, the National Tuberculosis control Programmes, community-based services and the communities themselves are essential.

1. Background

In recent years, the attention being given to the challenges of tuberculosis in children has been increasing within the global public health and tuberculosis control agenda. This has followed decades of neglect where children were generally outside the boundaries of National Tuberculosis control Programme (NTP) activities as these focused primarily on interrupting transmission by case-detection and effective treatment of people in the community with sputum smear-positive tuberculosis.[1]

The recent change of focus is welcome and a critical opportunity for a number of reasons:

1. Tuberculosis is an important treatable and preventable cause of morbidity and mortality in infants and young children (0-4 years) in tuberculosis endemic settings.[2,3] Therefore, while

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young children with tuberculosis are not a group responsible for most of the ongoing transmission in the community, they are important in the context of child survival, and most tuberculosis endemic countries in the world include reductions in under-5 mortality and improved child health as a major national priority.
2. Older children and adolescents (10-19 years) with tuberculosis do transmit tuberculosis and have unique diagnostic and treatment challenges[3,4], but we have scant knowledge of the burden and outcomes of tuberculosis in these age groups.
3. Tuberculosis in children is an important sentinel event that reflects recent transmission.[1,3] Therefore, accurate data of the burden of tuberculosis in children could potentially provide an important baseline for monitoring and evaluation of the wider epidemic or recent outbreaks, including of multidrug resistant tuberculosis.
4. Young children with tuberculosis have unique treatment needs, such as dosages and preparations.[5] Therefore, more accurate data on the potential market of drugs for children are required to inform drug procurement and ensure uninterrupted treatment, and also to support efforts in drug development.

2. Increasing attention to tuberculosis in children – recent global steps

In March 2011, the first international meeting on child tuberculosis was held in Stockholm as a joint initiative supported by the European Centre for Disease Control and the Stop TB Partnership. The meeting included a wide range of stakeholders representing the child healthcare sector, tuberculosis control programmes, researchers, non-governmental organizations, funding organizations, advocates, civil society organizations, and children and families affected by tuberculosis. The meeting initiated and endorsed a "Call to Action" with over 1,000 signatories posted on the Stop TB Partnership's website.[6] In 2012, children were the focus of attention on World TB Day for the first time. Sensing the need to provide future direction in addition to the guidance of the more technical policy documents, a Roadmap for Childhood Tuberculosis was developed by multiple collaborative partners, and this was launched in Washington DC on October 1st, 2013.[7]

The Roadmap for Childhood Tuberculosis represents a global "action plan" including comprehensive and practical action points aiming to engage a range of stakeholders in a common goal over the next decade. A major first step in order to implement key actions is to engage the relevant stakeholders and bring together those representing and working in the maternal and child health sector with those representing and working in NTPs. This has been achieved at the global level with the formation and strengthening of the child TB subgroup of the Stop TB Partnership, supported by the secretariat from the Global TB Programme. The Box lists ten key actions that also need to be taken at regional and national levels.[7]

Clear policy guidelines based as far as is possible on the current evidence base are required to provide guidance to NTPs, especially given the lack of confidence that NTPs and clinicians often have in engaging in child tuberculosis-related activities. In 2014, the WHO published the second edition of the "Guidance for national tuberculosis programmes on the management of tuberculosis in children".[8] The second edition includes 28 recommendations and expands on the first edition of 2006 by including specific chapters on the management of tuberculosis in HIV-infected children, children with multidrug resistant (MDR) tuberculosis, and implementation of integrated care. There are novel recommendations relating to the use of Xpert MTB/RIF in children and for revised dosages of first-line anti-TB drugs in children less than 25 kgs.

Box 1. The Childhood TB Roadmap - ten key actions to be taken at the global and national levels

1. Include the needs of children and adolescents in research, policy development and clinical practice.
2. Collect and report better data, including on preventive measures.
3. Develop training and reference materials on childhood tuberculosis for health care workers.
4. Foster local expertise and leadership among child health workers at all levels of the health care system.
5. Do not miss critical opportunities for intervention (e.g. use strategies such as intensified case-finding, contact tracing and preventive therapy); implement policies for early diagnosis; and ensure there is an uninterrupted supply of high-quality anti-tuberculous medicines for children.
6. Engage key stakeholders, and establish effective communication and collaboration among the health care sector and other sectors that address the social determinants of health and access to care.
7. Develop integrated family- and community-centred strategies to provide comprehensive and effective services at the community level.
8. Address research gaps in the following areas: epidemiology, fundamental research, the development of new tools (such as diagnostics, medicines and vaccines); and address gaps in operational research, and research looking at health systems and services.
9. Closing all funding gaps for childhood tuberculosis at the national and global levels.
10. Form coalitions and partnerships to study and evaluate the best strategies for preventing and managing childhood tuberculosis, and for improving tools used for diagnosis and treatment.

The World Health Organization (WHO) and The Union also developed ten training modules to complement the recent guidelines that are freely available on the WHO website.[9] The training is particularly focused on the health workers in the primary and secondary levels of care where the majority of children with suspected tuberculosis or that are close contacts of tuberculosis cases will present and be managed. The separation into modules with overlap between modules is deliberate so that training on childhood tuberculosis can readily be integrated into other ongoing activities such as HIV care, maternal and child health, integrated community case-management or annual reviews of NTPs, rather than encouraging the development of stand-alone childhood tuberculosis training workshops. The training material will be further complemented by a self-taught e-learning course that has been developed by The Union, the WHO and members of the Stop TB Partnership's Child Tuberculosis Subgroup, to be launched in 2015.

3. The development of regional and national initiatives for implementation

While members of the global Child Tuberculosis Subgroup have an important role regarding development of guidelines and training tools, technical assistance, advocacy and global representation; actual implementation to address the huge policy-practice gap in childhood tuberculosis requires a decentralized strategy with strong child TB champions in each country. We have therefore recently engaged and begun to implement such a strategy at the regional and national levels by supporting the development or strengthening of "child tuberculosis working groups" linking the

child health sector with NTPs. In March 2014, the WHO Western Pacific Regional Taskforce on Child Tuberculosis was formed following a meeting in Viet Nam of national representatives from nine countries. Country representatives provided current situational updates, identified priorities for implementation and have since developed national action plans. In September 2014, a Global Consultation held in Indonesia and facilitated by the WHO brought together representatives from countries in the South-East Asian and Eastern Mediterranean Regions to share experiences and learn further from Western Pacific Regional Taskforce representatives. These important workshops have included almost all of the high burden tuberculosis countries in the Asia-Pacific region.

4. Examples of recent national initiatives for implementation

It is difficult to know the true burden of tuberculosis in the Asia-Pacific region. Until recently, many NTPs reported that childhood tuberculosis accounted for less than 2% of the total burden. This is below the estimated global average of 6% by the WHO[10], and well below that which would be expected from high incidence tuberculosis countries with large populations of children.[1] One reason may be poor case-detection in children due to diagnostic challenges, and the potential to increase case detection has been illustrated in a recent study from Bangladesh.[11] However, there is also likely to be considerable under-reporting. A recent study from Indonesia reported that less than 2% of children diagnosed and treated for tuberculosis in Java were reported to the NTP.[12] For countries in the region where children with suspected tuberculosis access the same public health system and if diagnosed with tuberculosis are routinely reported, the proportion of the total tuberculosis caseload that is children ranges from 10% to 30%.[13–15]

A particularly stark example that illustrates the wide policy-practice gap relates to the management of children who are close contacts of infectious tuberculosis cases.[16] We have known for decades that infants and young children are particularly susceptible to developing tuberculosis following exposure and infection, and that preventive therapy can substantially reduce this risk. This evidence-base provides the rationale for the policy and guidelines to screen and manage children that are household contacts of tuberculosis cases, especially prioritizing those with sputum smear-positive tuberculosis.[8] The guidelines have been in place for decades, are almost universally accepted and yet rarely implemented, except in low tuberculosis endemic settings.[17]

A recent prospective cohort study in Indonesia reported the effectiveness and safety of implementing the symptom-based screening approach recommended by the WHO.[18] Of children that were close household contacts of cases with tuberculosis, 8% had tuberculosis that had not yet been detected, including one child with tuberculous meningitis, and were successfully treated. Of the asymptomatic contacts of less than 5 years that received preventive therapy according to national guidelines, none had developed tuberculosis after 1 year of active follow-up. Another recent study from Indonesia quantified the large existing gaps at each stage of the evaluation and management process.[19] Since 2011, the NTP of Viet Nam with the technical support of KNCV has implemented community-based contact screening and management in four provinces in Viet Nam, with the ultimate aim of stepwise implementation to all provinces by 2020.

There are other practical, structural issues that highlight the need for the development of communication and collaboration between the child health and tuberculosis control sectors. Children with tuberculosis do not present for diagnosis and management to the district TB unit of the NTP but rather to the general child health services, and the NTP will usually only become aware of the child should the child health workers register the case with the NTP. On the other hand, the child health services will not be able to provide appropriate management for children that are recent, close contacts of a case of infectious tuberculosis unless informed by the district TB unit or community health workers that have registered and provide treatment for that TB case. It soon becomes clear that there needs to be a mechanism in place that brings together the child health sector that cares for child tuberculosis cases and contacts with the NTP along with advocates and members representing the broader community.

An example from Bangladesh of such broad community representation in TB service provision was the training up of medicine shop owners to provide DOTS services successfully.[20]

The Figure illustrates a possible framework that highlights the potential roles of the child tuberculosis working group. The need for innovative approaches to integration and engagement of NTPs with the wider health sector are explicit priorities in WHO post-2015 global TB strategy.[21] Bangladesh provides an example of an active child tuberculosis working group that includes 21 members representing NTP, paediatricians, national paediatric association, researchers, academics, non-governmental organisations engaged in tuberculosis care and the WHO, with plans to invite a patient representative.

In almost all settings, the implementation of child tuberculosis activities that ultimately will improve case-detection, management and prevention of tuberculosis in children will require training, especially of those health workers that do not have a high level of expertise or clinical experience of childhood tuberculosis. Tools need to be developed or adapted so that training is integrated into other relevant training for the child health sector or NTP. A recent example from Bangladesh developed training manuals and learning tools and has trained 39 doctors as facilitators, 17 district health managers, 786 doctors on a 4-day module and 8,964 health workers including 619 doctors on a 1-day module (Shakil Ahmed, personal communication). While improving diagnosis through training is a major need, the importance of routine reporting and recording should also be emphasized at every opportunity. Improved data will provide the basis for identifying and addressing the gaps as well as for monitoring and evaluation of progress.

5. The need for community engagement

Efforts to address the wide policy-practice gap in order to reach the Roadmap's ultimate goal of achieving zero deaths from tuberculosis in children requires sustained advocacy, greater commitment, mobilization of adequate resources, and joint efforts by all stakeholders (Table). There are many misconceptions in the community and in health workers at primary care settings around the management and prevention of tuberculosis in children. There

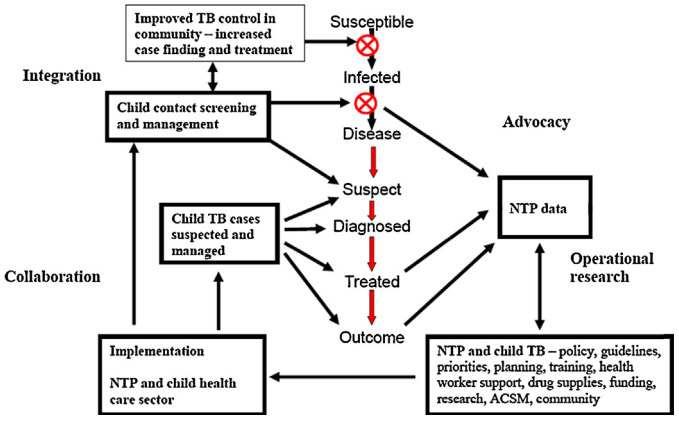

Figure 1. Interventions that target stages of the continuum in children from susceptibility to disease and outcome.

Table 1
Engaging key stakeholders in the community to address child tuberculosis

Stakeholders	Main roles
Community-based organizations and nongovernmental organizations	Support local programmes according to capacity. This may include supporting initiatives aimed at increasing community education and awareness or providing contact tracing, preventive therapy, diagnosis, treatment support or referral. Provide technical assistance and training if appropriate (counselling and treatment literacy)
Community leaders (teachers, school authorities, administration, pre-school)	Promote tuberculosis education and awareness. Help the community to understand tuberculosis and its treatment to decrease the stigma associated with the disease. Support case-finding efforts and adherence to treatment. Promote the empowerment of children and families affected by tuberculosis by engaging them to help the community better understand the disease.
Private health care sector	Ensure that children with tuberculosis are managed according to national guidelines Report all children with a diagnosis of tuberculosis to the National Tuberculosis control Programme.
Researchers	Develop child-friendly, point-of-care diagnostics Develop child-friendly formulations of anti-tuberculous medicines. Develop improved vaccines Address the many knowledge gaps that exist
Advocacy groups (CSO, CBO and NGOs)	Promote education and awareness. Help the community understand tuberculosis and its treatment to reduce stigma. Advocate for resource mobilization. Provide input into national and international policy-making

is a need to address gaps in knowledge and misconceptions by communicating clearly in language that communities understand. For example, there is a lack of awareness that infants and young children are a particular high risk group for severe disease that can often be prevented, that young children are rarely responsible for transmission, that treatment outcomes for children are usually excellent, and that children tolerate anti-tuberculosis therapy very well with minimal risk of toxicity. In addition, children with tuberculosis continue to be stigmatized and in some communities, children of tuberculosis cases are wrongly advised to be separated from their parent for the duration of the parent's treatment. There is surprisingly little material developed that informs about the specific challenges of tuberculosis in children, and that could support community engagement. The community-based pilot project of child contact screening in Viet Nam has included the development of wall posters and pamphlets for families to read to better understand the rationale for contact screening and preventive therapy.

6. Summary

We highlight recent regional and national initiatives that aim to improve diagnosis, management, outcomes and prevention for children with tuberculosis in the Asia-Pacific region. Strong collaborative efforts between the child health sector, the community and the NTP, and led by local child TB champions, are essential to improve the care of children and address persistent policy-practice gaps.

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