The Global Nature of Childhood Tuberculosis

After several decades of neglect, childhood tuberculosis (TB) is receiving some of the attention it deserves. Although the common perception is that TB has disappeared from the United States, there are almost 10,000 cases annually, with >1,000 occurring in children. There are many thousands of children with untreated latent TB infection (LTBI) at risk of developing TB disease, who either were missed during contact investigation of adults with TB disease in the United States or who were not tested during immigration to the United States.

Pang et al describe the epidemiology of TB in preschool-aged US children. They highlight and quantify a recently described risk factor for childhood TB in a low-incidence setting: parental foreign birth. A 2012 Pediatrics article found that two-thirds of all children and adolescents with TB in the United States had at least 1 foreign-born parent, and only one-quarter of children with TB lacked an international connection. Before 2009, children immigrating to the United States were not routinely tested for LTBI or TB disease. The 2009 Centers for Disease Control and Prevention (CDC) Technical Instructions for children immigrating to the United States endorse testing children ages 2 to 14 years for LTBI and treatment of infected children after arrival in the United States. The hope is that this immigration screening protocol will decrease the reservoir for future cases among the foreign-born. However, some US-born children with LTBI are not detected by existing screening algorithms. Having a foreign-born parent is not currently included as a risk factor in the American Academy of Pediatrics–endorsed LTBI screening questionnaire and is not included in most state and local public health questionnaires. It is unclear why having a foreign-born parent is a risk factor. The parent may develop infectious TB, but this also may be a marker that foreign visitors to the home, who are not screened for TB before entry to the United States, may have undetected infectious TB. One study from California showed that having an adult foreign visitor in the home was an independent risk factor for a child developing LTBI.

The results of the Pang et al study lead one to question if TB can be eliminated domestically solely by focusing within our own borders. Rates of TB in US-born adults are at an all-time low and are 11 times lower than TB rates in foreign-born persons, who now comprise almost two-thirds of US cases. We cannot eradicate TB domestically until better TB control is attained in high-prevalence nations, especially those from which the United States receives many immigrants and visitors. The CDC Technical Instructions endorse screening for TB disease by chest radiograph for immigrants older than 14 years of age and do not emphasize testing for LTBI in this population. The result is that many adolescent immigrants have LTBI that goes undetected. Although immigrant children ages 2 to 14 years are tested for LTBI, many do not receive immediate treatment in the United States because they lack health insurance or medical homes, and local public health departments...
no longer provide treatment of LTBI because of severe budget cuts. Experts have advocated for US investment in the TB control programs of countries sending the most immigrants and visitors to the United States. For example, it has been estimated that for each 1 US dollar invested in the directly observed therapy program in Mexico, the United States would save $3.5 These cost savings do not even factor in the enormous costs of diagnosing and treating foreign-born individuals with multidrug-resistant TB, which is much more prevalent in the countries that send the most immigrants and visitors to the United States and which can be prevented by directly observed therapy.

The global burden of childhood TB remains enormous. The World Health Organization (WHO) estimates that in 2012 there were 530,000 cases of TB disease and 74,000 deaths among non-HIV-infected children9; there are no estimates for HIV-infected children9; there are no estimates for HIV-infected children who carry a huge burden of TB in sub-Saharan Africa and parts of Asia. In addition, WHO estimates that 9.7 million children have been orphaned by the loss of 1 or both parents to TB. The tragedy is that many childhood TB cases could be prevented with simple, safe, and highly effective interventions that are not made available. As an example, WHO has recommended for 3 decades that children <5 years of age who live in a household with an adult with TB disease be evaluated; children with symptoms should be evaluated for TB disease and those without symptoms should receive 6 months of isoniazid therapy to prevent disease. This approach likely would save tens of thousands of lives annually, but treatment of these children with isoniazid does not occur in most high-burden countries.

There are several reasons why childhood TB has been neglected. Most important is the misconception that childhood TB is difficult to diagnose because it can be culture-confirmed in only 20% to 40% of cases (compared with 90% of adult cases). However, by using simple tools such as symptoms, tuberculin skin testing, and chest radiography and epidemiologically linking the child with a recent case of TB the clinical diagnosis can be established in most cases. Unfortunately, in many high-burden countries, the only method of diagnosis, and the basis for reporting cases, is microscopic examination of sputum, which detects <5% of childhood cases. As a result, many childhood TB cases are never diagnosed and those children who are diagnosed clinically often go unreported. Most children with pulmonary TB are not infectious to others, a public health “dead end” in terms of transmission that makes these cases seem less important. The lack of measurement and perceived inconsequence of childhood TB result in lack of awareness and disinterest among public health policy makers and national TB programs. Unfortunately, because TB care and control in high-burden countries reside within a national TB program, providers of child health care, including pediatricians, have little awareness or knowledge of the disease, and there is scant communication between the TB control and child health systems. The end result is that childhood TB “falls through the cracks” between child health and TB control, and neither system has made it a priority.

In response to this crisis, several organizations (WHO, International Union Against Tuberculosis and Lung Disease, Stop TB Partnership, USAID, United Nations Children’s Fund, CDC, and Treatment Action Group) have developed the Roadmap for Childhood Tuberculosis.10 This document reveals that the goal of reaching zero TB deaths among children worldwide is within our grasp. Achieving this goal will require sustained advocacy, greater commitment, mobilization of increased resources, and a joint effort by all stakeholders involved in providing health care for children and in TB control. The document has 4 key messages: (1) childhood TB urgently needs public attention, prioritization, and commitment; (2) additional basic and operational research for childhood TB is needed and should be funded; (3) childhood TB can be effectively addressed only with collaboration across the health system and community; and (4) enhanced investment is critical to end TB deaths among children. A key element of the plan is to include TB services in the many maternal and child health programs that exist already in low-income, high-TB-burden countries. It is critical that high-income, low-burden countries, like the United States, contribute resources to affect this roadmap, not only to address childhood TB in the world but to eliminate it within our own borders.

REFERENCES


### The Global Nature of Childhood Tuberculosis

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