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Finding and treating tuberculosis in children

TANZANIA IS ONE OF THE FIRST AFRICAN COUNTRIES TO TURN THE TIDE ON PEDIATRIC TB

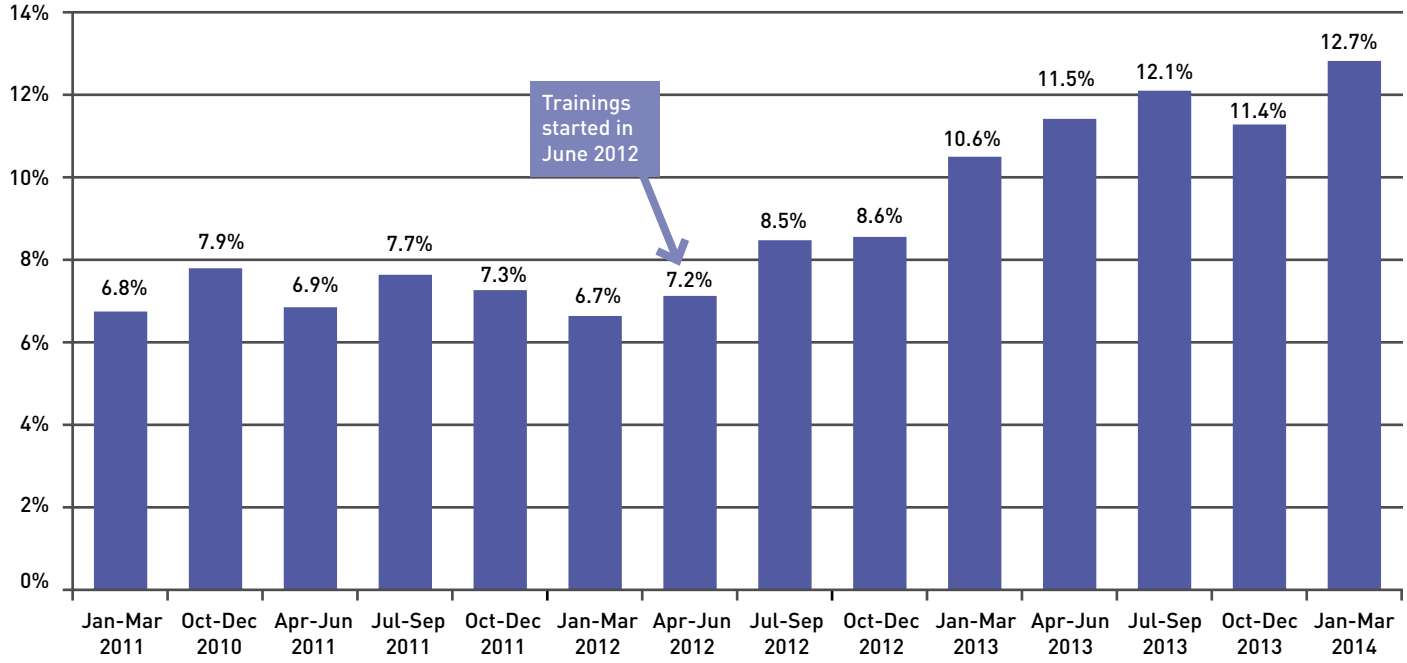
Since 2010, PATH has worked with international partners, the Tanzanian Ministry of Health, and in-country partners to make Tanzania one of the first countries in Africa to turn the tide on pediatric tuberculosis (TB). Together, we developed new national guidelines, conducted comprehensive trainings in six regions of the country, and are providing ongoing mentorship. Hundreds of clinicians are now able to recognize the signs of pediatric TB and take action so that children get the treatment they need—and, most importantly, the chance to regain their health and lead full lives.

THE CHALLENGE OF PEDIATRIC TB

The magnitude of TB disease among children globally is difficult to ascertain due to challenges in diagnosis and reporting. However, data from the National TB and Leprosy Programme (NTLP) show that pediatric cases constitute on average about 8% of all TB cases notified annually.

The urgency of the problem of TB in children, whose full scope is still not fully known, cannot be underestimated. The World Health Organization (WHO) estimates in 2012 revealed that up to 74,000

FIGURE 1. **Pediatric TB cases as a percentage of total notifications in PATH-supported regions.**



children die from TB each year and children account for around half a million new cases annually. In fact, the actual burden of TB in children is likely higher, especially given the challenge in diagnosing childhood TB. Diagnosing TB in infants and children is extremely difficult due to a lack of appropriate diagnostic tools for their age group. As a result, children are often misdiagnosed and treated inappropriately. A postmortem study in Zambia found that one-fifth of children who died of "respiratory illnesses" had TB.

While bacteriologic confirmation should always be attempted, it may not be possible. When bacteriologic confirmation is not achieved, the child's clinical history, physical examination, and radiographic findings should be considered. For clinicians to accurately diagnose a child using these methods, they need appropriate guidelines, training, and tools.

SETTING THE STAGE TO ADDRESS PEDIATRIC TB

To figure out how to approach the challenge in Tanzania, the NTLP requested support from the United States Agency for International Development (USAID). Under TB IQC Task Order 1, PATH was tasked with bringing together the right experts and leading an effort that would result in better case detection and successful treatment of children with TB.

To guide this process, PATH convened a multidisciplinary technical expert group comprised of pediatricians, physicians, clinicians, nurses, and a monitoring and evaluation officer from Tanzania, and experts from Dartmouth's Geisel School of Medicine. The team assessed the situation and then developed national guidelines that outline how each level of health care worker can diagnose, treat, and care for children with TB. The guidelines provide technical approaches not only for the management of pediatric TB, but also for TB/HIV, multidrug-resistant TB (MDR-TB), and nutrition in children, and for strengthening prevention and ensuring adequate infection-control measures in health facilities.

The expert group developed a comprehensive program for pediatric TB training and management based on the guidelines. The series of training materials and job aids that formed the core tools of the program include:

- A ten-module, five-day training curriculum.
- A manual for in-country master trainers.
- Easy-to-read posters and job aids that guide health care providers through the steps of diagnosing TB in children.
- A screening tool, score chart, and algorithms.
- Registers known as "counter books" in which providers track screenings and results.

Each of these tools was first piloted in 13 facilities, then reviewed and revised one more time before they were rolled out in the six regions where PATH works. This process was a true collaborative and logistical feat.

ROLLING OUT THE PLAN

The NTLP worked with PATH and ICAP to support a massive training program, starting with a cadre of 49 master trainers. These trainers then trained 812 health care providers from pediatric wards, reproductive and child health departments, care and treatment clinics, and TB clinics at the district and regional hospitals.

At the end of each training, the health care workers developed action plans to increase case detection in their home facilities. Through subsequent supervision visits, PATH has provided ongoing training and supervision to trainees as they come across more complicated cases or as new questions arise.

RESULTS

With PATH support, Tanzania has made significant strides in improving the detection and management of pediatric TB. In 2010–2011, pediatric TB cases accounted for 6.7 to 8 percent of all TB notifications in Tanzania. This percentage has increased steadily since the initiation of pediatric TB trainings in June 2012 (see Figure 1). As of the middle of 2014, pediatric TB case notification in the six PATH supported-regions has increased to 12.7 percent of total case notification—a notable increase from previous quarters and more likely capturing the true proportion of cases.

In addition, almost 70 percent (up from 30 percent in 2012) of the pediatric TB patients who were found to be HIV positive were also enrolled on antiretroviral treatment, and we expect this percentage to increase in the future.

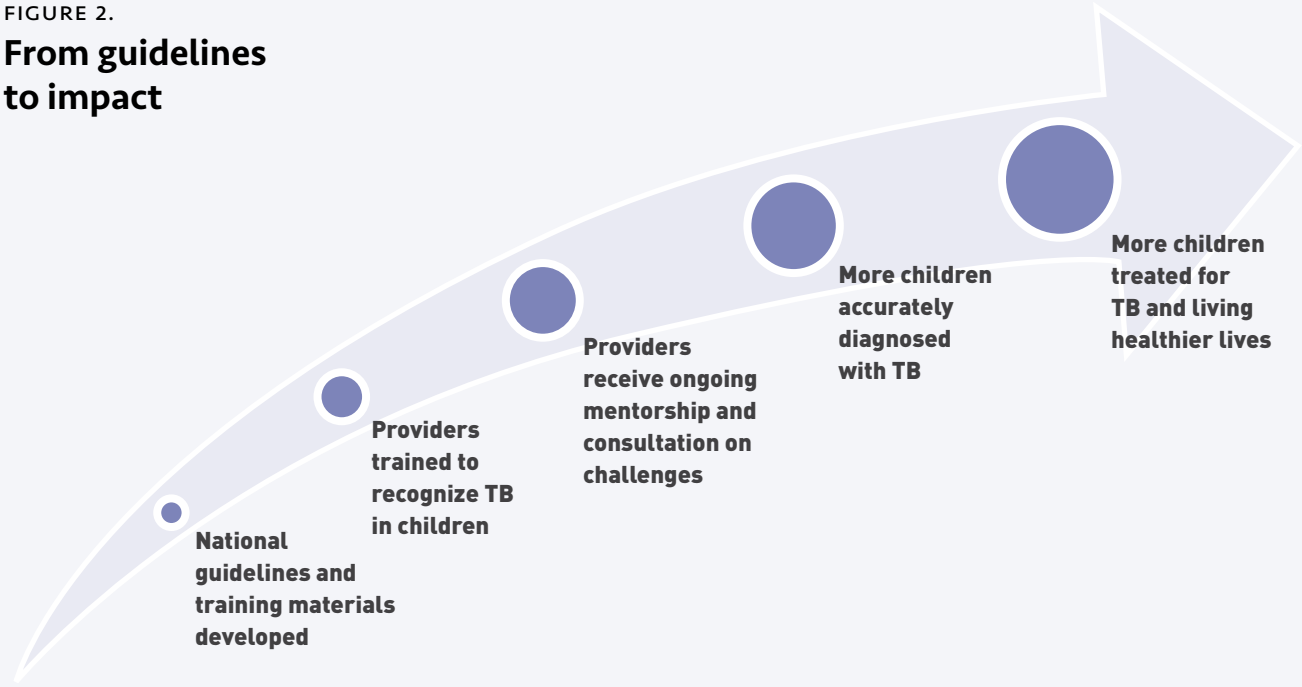
Lastly, a follow up assessment conducted by Dartmouth's Geisel School of Medicine of 41 healthcare workers in Dar es Salaam and 76 in Arusha found that the clinicians had a good comprehension of pediatric TB management principles. Among the cohort surveyed, the average scores ranged from 75 to 93 percent on general knowledge, diagnosis, treatment, monitoring of TB treatment, and TB and HIV co-management.

COMMUNITY LEVEL SUPPORT FOR PEDIATRIC TB

To expand on the success of these activities, PATH has engaged other members of the community. Specifically, PATH is sensitizing the council health management teams (who oversee health services in each district) on pediatric TB activities so that the CHMTs can incorporate the activities into their Council Comprehensive Health plan and act upon them. The council health management teams are also developing district action plans to underscore the importance of addressing pediatric TB in a more comprehensive way.

FIGURE 2.

From guidelines to impact



A score chart that saves lives

"I might have missed many children because of lack of awareness on pediatric TB," says Helen, a clinician from the Kitunda Health Center dispensary, in the Dar es Salaam region of Tanzania, who took the pediatric TB training. "If I had known this scoring chart, I would have saved many lives."

Since the training, Helen and her coworkers at Kitunda have diagnosed a number of children with TB, including 8-year-old Aisha Jumanne. Aisha was living with her aunt in Kitunda when she fell sick. After three months of fever and painful swelling in her right cervical lymph nodes, she was brought to the dispensary in January 2013. She did not have a cough, but she had lost weight, had trouble sleeping, and was very weak. Like many children with TB, she had missed many days of school. She was also living with HIV/AIDS.

Helen decided to use the score chart for diagnosis of pulmonary TB in children. Aisha's score was 11, which suggested TB (a score of 7 or more indicates a high likelihood of TB). While her sputum sample was negative, her chest X–ray was suggestive of TB.

Helen diagnosed Aisha with TB lymphadenitis and started her on anti-TB drugs the same day. After two weeks of treatment, Aisha's health improved, and the lymph node swelling had subsided. Three weeks after being diagnosed, she was put on antiretroviral drugs, per national guidelines. Aisha is now living happily with her family, back in school, and getting the support she needs for both TB and HIV.

SCORE IF SIGN OR SYMPTOM PRESENT						
	0	1	2	3	4	Score
General features						
Duration of illness	Less than 2 weeks	2-4 weeks		More than 4 weeks		
Failure to thrive or weight loss	Weight gain	No weight gain or weight faltering		Weight loss		
TB contact	None	Reported (but no documentation) smear-negative or EPTB		Smear positive (with documentation)		
TST	Negative, not done			Positive		
Malnutrition not improved after four weeks of therapy				Present		
Unexplained fever not responding to appropriate therapy			Positive			
Local features						
Chest x-ray				TB-suggestive features like infiltration, cavity, or hilar lymph nodes		
Painless, enlarged lymph nodes		Any non-cervical lymph nodes		Positive cervical lymph nodes		
Swelling of bones or joints				Positive		
Unexplained ascites or abdominal mass				Positive		
Central nervous system findings: meningitis*, lethargy, irritability and other behavior changes				Positive		
Angle deformity of the spine					Positive	
TOTAL SCORE A score of 7 or more indicates a high likelihood of TB. Refer the child for TB treatment.						

"Having received this sensitization," said one CHMT member, "we will do follow-up of all cases reported as pneumonia or bronchitis to know exactly whether they are diagnosed correctly and [clinicians] don't miss TB. We will do this during our routine supportive supervisions".

PATH has also engaged community-based organizations to bring children to the hospital for screening and treatment, especially those children who have a history of TB contact, present with a cough, or have signs and symptoms of failure to thrive. PATH has made it a point to include information about pediatric TB in all of our trainings (including MDR-TB, DOTS, TB/HIV, and ACSM) whether we are talking to physicians, private drug sellers, or traditional healers.

In addition to the work described above, the PATH Tanzania TB project is providing support to 1,127 health facilities related to infection control, the programmatic management of drug-resistant TB, and introduction of new diagnostics, such as GeneXpert.

For more information, please visit www.path.org or contact Dr. Zahra Mkomwa, PATH Tanzania TB/HIV project director.

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