

## A new roadmap for childhood tuberculosis



On Oct 1, 2013, WHO and global partners launched a roadmap to end tuberculosis deaths in children worldwide.<sup>1</sup> The roadmap identifies key actions that must be taken, including increased and targeted research, partnerships between key stakeholders, and strategic economic investment. The roadmap also shows the crucial lack of global emphasis on tuberculosis prevention and treatment for one of the most vulnerable populations. This intervention comes at a pivotal juncture because rates of drug-resistant tuberculosis have been increasing worldwide, particularly in the WHO European Region, with severe implications for child tuberculosis morbidity and mortality.

Globally, children younger than 15 years account for about 6% of the 8.6 million cases of tuberculosis, and about 5% of the 1.4 million deaths that occur annually from the disease.<sup>2,3</sup> Children have been traditionally viewed to pose less of a risk for transmission than adults because they often have paucibacillary disease, which is also harder to diagnose with sputum smear microscopy, culture, and molecular tests.<sup>4</sup> If tuberculosis is undetected and untreated, children are at high risk of death, especially in the context of multidrug-resistant and extensively drug-resistant tuberculosis. 15 of the 27 countries with a high burden of multidrug-resistant and extensively drug-resistant tuberculosis worldwide are in the WHO European Region,<sup>2</sup> with 99% of the regional disease burden in 18 high-priority countries (Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Romania, Russia, Tajikistan, Turkey, Turkmenistan, Ukraine, and Uzbekistan).<sup>5</sup> 6% of the total estimated incidence of new and relapsed tuberculosis cases occurred in these countries (376 200 cases),<sup>2,5</sup> in 2011, an estimated 23 000 children had tuberculosis, of whom nearly 5000 are estimated to have had multidrug-resistant or extensively drug-resistant disease. These estimates contrast sharply with the fewer than 1000 cases of childhood tuberculosis that were detected and reported in these countries.<sup>2,5</sup>

In response to the alarming increase in multidrug-resistant and extensively drug-resistant tuberculosis in the WHO European Region, in 2011 the Consolidated Action Plan to Prevent and Combat Multidrug and

Extensively Drug Resistant Tuberculosis (2011–15) was endorsed by the sixty-first Regional Committee for Europe, and implemented in all 53 member states.<sup>6,7</sup> The plan includes essential milestones and activities for childhood tuberculosis, with the aim to scale-up access to treatment; prioritise childhood tuberculosis in member states' national strategic plans; and develop a special response for diagnosis and treatment of tuberculosis in children, including identifying policies (or lack of policies) that contribute to underdiagnosis.

The table summarises data on national childhood tuberculosis policies collected by the WHO Europe

© 2014 World Health Organization; licensee Elsevier. Open access under [CC BY-NC-ND license](#). published without any waiver of WHO's privileges and immunities under international law, convention, or agreement. This article should not be reproduced for use in association with the promotion of commercial products, services or any legal entity. There should be no suggestion that WHO endorses any specific organisation or products. The use of the WHO logo is not permitted. This notice should be preserved along with the article's original URL.

	Number of high-priority countries (n=15)*
<b>Case detection</b>	
Contact tracing†	
Close household	15
Close non-household	8
Casual	7
Community	6
Examinations if tuberculosis contact†	
TST	15
Bacteriological examination	9
Interferon-γ-release assays	3
Radiograph of the chest	14
Fluorography	3
CT	9
Other blood analyses	10
<b>Preventive treatment</b>	
Preventive treatment for latent tuberculosis‡	
Children with tuberculosis contact, irrespective of age and irrespective of TST results	7
Children with tuberculosis contact, irrespective of age with a positive TST	8
Children with tuberculosis contact, with positive TST of certain age range	2
Children detected through mass tuberculin skin testing with a positive TST, irrespective of age	2
Children with HIV	8
Other	7
Type of preventive treatment†	
Isoniazid	15
Other	4
Preventive treatment for child contacts of MDR tuberculosis patients (individualised treatment on the basis of drug-resistance pattern of index case)	4
Preventive admission to hospital	
Yes, for the entire treatment period	3
Yes, for the initial period	3
No, treatment is given ambulatory for the full period	6
Ambulatory for the full period with a proportion of children referred to sanatoriums	3

(Continues on next page)

	Number of high-priority countries (n=15)*
(Continued from previous page)	
<b>Treatment for active tuberculosis disease</b>	
Paediatric national guidelines	14
Standardised treatment for active or assumed drug-sensitive tuberculosis	15
Children prescribed MDR regimen	
Only children with bacteriologically confirmed MDR tuberculosis	4
Both children with bacteriologically confirmed MDR tuberculosis and children with active tuberculosis in close contact with patients with infectious MDR tuberculosis	11
Type of MDR treatment	
Individualised	9
Standardised	3
Both	2
Admission to hospital for active tuberculosis†	
Yes, for the entire treatment period	7
Yes, for the initial period	3
No, ambulatory for the full period	5
Ambulatory treatment preferred, but hospital stay might be necessary	5

TST=tuberculin skin test. MDR=multidrug-resistant.\*Armenia, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkey, Turkmenistan, Ukraine, and Uzbekistan. †Categories not mutually exclusive.

**Table: Number of countries with policies for detection, preventive treatment, and active treatment of children with tuberculosis**

task force for childhood tuberculosis from 15 (of the 18) high-priority countries that provided policy information from September, 2012, to January, 2013.<sup>3</sup> At present, the 15 countries have policies that adhere to the 2006 WHO guidelines for childhood tuberculosis<sup>4</sup> with regard to contact-tracing of close household contacts, detection with tuberculin skin testing, and provision of isoniazid preventive treatment for children with a close household tuberculosis contact. However, only eight countries have policies for contact tracing for children with a close non-household contact (as recommended by WHO for children younger than 5 years<sup>3</sup>). Additionally, four countries recommend a multidrug-resistant tuberculosis treatment regimen only in children with bacteriologically confirmed multidrug-resistant tuberculosis. However, since bacteriological confirmation is often difficult in children, WHO recommends that, if active tuberculosis disease develops in children with a close contact with multidrug-resistant tuberculosis, a multidrug-resistant tuberculosis drug regimen should be promptly started. Although 11 countries have this policy in place, its efficacy is predicated on effective contact investigation. For children who are detected with active tuberculosis

or are given preventive therapy for latent infection, several countries require hospital admission for either the initial 2 month phase or the entire length of preventive and active tuberculosis treatment (three and seven countries, respectively). However, admission of children to tuberculosis wards for an unnecessarily long duration places them at high risk of primary infection or reinfection with multidrug-resistant or extensively drug-resistant tuberculosis.<sup>9,10</sup> Forthcoming updated WHO guidelines for the management of childhood tuberculosis will add clarity for countries about these and other issues, including detection with molecular diagnostics and use of paediatric drug formulations.

In the context of multidrug-resistant and extensively drug-resistant tuberculosis, a priority in the WHO European region is to accelerate the adoption of updated childhood tuberculosis guidelines into national strategic tuberculosis policies. Additionally, efforts to ensure that policy is aligned with practice remain at the core of effectively detecting disease and saving lives of children with tuberculosis. In high-priority countries, there is a crucial scarcity of qualified human resources to manage childhood tuberculosis and multidrug-resistant and extensively drug-resistant tuberculosis, and irregular access to second-line drugs is still a challenge. The new roadmap for childhood tuberculosis importantly serves as a call to action for all stakeholders in child health to urgently address these issues.

Key actions to increase awareness and capacity for contact investigation, management of childhood tuberculosis, and surveillance are in line with the Consolidated Action Plan. These actions will be vital to shift policy and place a spotlight on prevention and combat of multidrug-resistant and extensively drug-resistant tuberculosis in the most vulnerable populations.<sup>4</sup>

*Colleen D Acosta, Valiantsin Rusovich, Anthony D Harries, Sevim Ahmedov, Martin van den Boom, \*Masoud Dara*  
 WHO Regional Office for Europe, Tuberculosis and Multidrug-resistant Tuberculosis Programme, UN City, 2100 Copenhagen, Denmark (CDA, MvdB, MD); WHO Country Office, Minsk, Belarus (VR); International Union against Tuberculosis and Lung Disease, Paris, France (ADH); London School of Hygiene and Tropical Medicine, Department of Clinical Research, London, UK (ADH); and USAID, Health Infectious Diseases and Nutrition Division, Washington, DC, USA (SA)  
 mdd@euro.who.int

We declare that we have no conflicts of interest. Collection of policy data by the WHO Regional Office for Europe, Childhood TB taskforce was funded by the USAID Regional Platform. Analysis of the data was supported through the SORT IT operational research programme run by the Operational Research Unit (LUXOR), Médecins sans Frontiers (Brussels and Luxembourg), The Centre for Operational Research, International Union against TB and Lung Disease (France), The Union South-East Asia Regional Office, and the Special Programme for Tropical Disease Research (TDR) at the WHO (Geneva). The views expressed in this Comment are solely those of the authors.

- 1 WHO. Roadmap for childhood tuberculosis. Geneva: World Health Organization, 2013. [http://www.who.int/iris/bitstream/10665/89506/1/9789241506137\\_eng.pdf](http://www.who.int/iris/bitstream/10665/89506/1/9789241506137_eng.pdf) (accessed Nov 26, 2013).
- 2 WHO. Global Tuberculosis Report 2012. Geneva: World Health Organization, 2012. [http://www.who.int/iris/bitstream/10665/75938/1/9789241564502\\_eng.pdf](http://www.who.int/iris/bitstream/10665/75938/1/9789241564502_eng.pdf) (accessed Nov 26, 2013).
- 3 WHO. Global Tuberculosis Report 2013. Geneva: World Health Organization, 2013. [http://www.who.int/iris/bitstream/10665/91355/1/9789241564656\\_eng.pdf](http://www.who.int/iris/bitstream/10665/91355/1/9789241564656_eng.pdf) (accessed Nov 26, 2013).
- 4 Stop TB Partnership Childhood TB Subgroup, WHO. Guidance for National tuberculosis programmes on the management of tuberculosis in children. *Int J Tuberc Lung Dis* 2006; **10**: 1205–11.
- 5 European Centre for Disease Prevention and Control, WHO Regional Office for Europe. Tuberculosis surveillance and monitoring in Europe 2013. Stockholm: European Centre for Disease Prevention and Control, 2013. [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0004/185800/Tuberculosis-surveillance-and-monitoring-in-Europe-2013.pdf](http://www.euro.who.int/__data/assets/pdf_file/0004/185800/Tuberculosis-surveillance-and-monitoring-in-Europe-2013.pdf) (accessed Nov 26, 2013).
- 6 WHO Regional Office for Europe. Roadmap to prevent and combat drug-resistant tuberculosis. Copenhagen: World Health Organization, 2011. [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0014/152015/e95786.pdf](http://www.euro.who.int/__data/assets/pdf_file/0014/152015/e95786.pdf) (accessed Nov 26, 2013).
- 7 Abubakar I, Dara M, Manissero D, Zumla A. Tackling the spread of drug-resistant tuberculosis in Europe. *Lancet* 2012; **379**: e21–23.
- 8 WHO. Recommendations for investigating contacts of persons with infectious tuberculosis in low- and middle-income countries. Geneva: World Health Organization, 2012. [http://apps.who.int/iris/bitstream/10665/77741/1/9789241504492\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/77741/1/9789241504492_eng.pdf) (accessed Nov 26, 2013).
- 9 Gelmanova IY, Keshavjee S, Golubchikova VT, et al. Barriers to successful tuberculosis treatment in Tomsk, Russian Federation: non-adherence, default and the acquisition of multidrug resistance. *Bull World Health Organ* 2007; **85**: 703–11.
- 10 Vázquez-Gallardo R, Anibarro L, Fernández-Villar A, et al. Multidrug-resistant tuberculosis in a low-incidence region shows a high rate of transmission. *Int J Tuberc Lung Dis* 2007; **11**: 429–35.