

The upcoming UN general assembly resolution on tuberculosis must also benefit children



Great progress has been made in recent years towards the development of improved tools for tuberculosis. We now have a 3-month, once-weekly regimen for tuberculosis prevention (isoniazid and rifapentine), rapid molecular tests to diagnose drug-susceptible and drug-resistant tuberculosis, a 9-month regimen that cures 80% of patients with multidrug-resistant (MDR) tuberculosis,¹ and two new drugs (bedaquiline and delamanid) that have been approved by stringent regulatory authorities. However, the progress for children, who have only recently been recognised to have a huge burden of tuberculosis disease, has been minimal. Isoniazid and rifapentine, bedaquiline, and delamanid remain largely inaccessible to children, and no data are available on the performance and safety of the shorter MDR tuberculosis regimen in children. Additionally, all existing diagnostic tests are inadequate to diagnose tuberculosis in young children, especially those aged below 5 years, who cannot expectorate and usually have paucibacillary tuberculosis. However, the greatest shortcoming has been the failure to systematically implement interventions that are known to be highly effective in settings that have a high incidence of tuberculosis. For many years, isoniazid preventive therapy has been recommended for children aged below 5 years or patients living with HIV who have been exposed to patients with newly diagnosed, bacteriologically confirmed tuberculosis, yet less than 15% of eligible children at high risk of developing tuberculosis receive preventive therapy.² Child-friendly formulations for drug-sensitive tuberculosis are available, and child-friendly formulations for second-line medicines are pre-qualified and available. However, over 96% of children who die from tuberculosis never access treatment.³ The same child-friendly, water-dispersible tablets used during the continuation phase of treatment can also be used for preventive therapy if given for a period of 3 months, but this practice is rarely encouraged or implemented.

Programmatic approaches, including contact tracing, with a demonstrated ability to reach children affected by tuberculosis are not systematically scaled up. In 2016, less than half (434 044; 43%) of the estimated 1 million children with tuberculosis were reported to national

tuberculosis programmes, indicating massive under-diagnosis and insufficient access to appropriate care.² As a result, 253 000 children (around 700 a day on average) died of a preventable and curable disease.² Although age-disaggregated data on MDR tuberculosis are not even reported to national authorities, indications are that less than 10% of the estimated 30 000 children who develop MDR tuberculosis every year are diagnosed.^{4,5} To detect and cure the majority of children with tuberculosis, we need strong political leadership encouraging multisectoral collaboration to provide universal access to tuberculosis care for children.^{6,7} We need to take the opportunities afforded by the WHO End TB Strategy to close the wide policy-practice gap in order to prevent the disease from developing among the over 2.4 million exposed children aged below 5 years who are at the highest risk each year.⁸ We need to address tuberculosis in the context of child survival, as a common but underappreciated cause of under-5 mortality in tuberculosis-endemic countries, and also as a cause or comorbidity of other common childhood illnesses—especially pneumonia, meningitis, malnutrition, and HIV.⁹ We need to strengthen health systems to integrate and decentralise tuberculosis care and prevention within maternal and child health services, especially at the frontline, to end preventable deaths.¹⁰ Additionally, we need increased investment in paediatric tuberculosis research and development to produce a vaccine with better protective efficacy, an accurate, non-sputum-based point-of-care diagnostic, and shorter, safer, and more child-friendly treatment regimens. It is also important to recognise that adolescents are poorly served by traditional adult services, yet frequently develop adult-type disease, which may contribute significantly to disease transmission in the community.¹¹

The United Nations High-Level Meeting on TB in September, 2018, marks an unprecedented opportunity to strengthen countries' commitment to ending TB, but new resolutions should also benefit children. The Child and Adolescent TB Working Group of the Stop TB Partnership proposes that countries commit to the following targets, in line with target 3.2 of the UN Sustainable Development Goals (to end preventable

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deaths of newborns and children under 5 years of age), the WHO Moscow Declaration to End TB, and the WHO Global Strategy for Women's, Children's and Adolescent's Health: (1) by 2019, all states have established an inter-ministry task force and developed a funded action plan to address child tuberculosis comprehensively across maternal, child, and adolescent populations; (2) by 2022, 90% of children with household exposure to an infectious tuberculosis case (2-4 million children under 5 years of age, and HIV-infected children of any age) receive preventive therapy each year; (3) by 2022, 90% of children with tuberculosis and MDR tuberculosis are diagnosed (respectively 900 000 and 28 800 each year), given appropriate treatment, and reported to national tuberculosis programmes; and (4) from 2018, countries steeply increase their research funding to address the needs of children, especially for research towards the development of new child-friendly diagnostics, treatments, and an improved vaccine.

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We declare no competing interests

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- 1 World Health Organization. WHO treatment guidelines for drug-resistant tuberculosis (2016 update). <http://www.who.int/tb/areas-of-work/drug-resistant-tb/treatment/resources/en/> (accessed March 15, 2018).
- 2 World Health Organization. Global tuberculosis report 2017. http://www.who.int/tb/publications/global_report/en/ (accessed March 13, 2018).

- 3 Dodd PJ, Yuen CM, Sismanidis C, Seddon JA, Jenkins HE. The global burden of tuberculosis mortality in children: a mathematical modelling study. *Lancet Glob Health* 2017; **5**: e898–906.
- 4 Dodd PJ, Sismanidis C, Seddon JA. Global burden of drug-resistant tuberculosis in children: a mathematical modelling study. *Lancet Infect Dis* 2016; **16**: 1193–201.
- 5 Jenkins HE, Tolman AW, Yuen CM, et al. Incidence of multidrug-resistant tuberculosis disease in children: systematic review and global estimates. *Lancet* 2014; **383**: 1572–79.
- 6 Yuen CM, Jenkins HE, Chang R, Mpunga J, Becerra MC. Two methods for setting child-focused tuberculosis care targets. *Public Health Action* 2016; **6**: 83–96.
- 7 World Health Organization. Roadmap for childhood tuberculosis: toward zero deaths. 2013. <http://www.who.int/tb/publications/tb-childhoodroadmap/en/> (accessed March 13, 2018).
- 8 Graham SM. The management of infection with *Mycobacterium tuberculosis* in young children post-2015: an opportunity to close the policy-practice gap. *Expert Rev Respir Med* 2017; **11**: 41–49.
- 9 Graham SM, Sismanidis C, Menzies HJ, Marais BJ, Detjen AK, Black RE. Importance of tuberculosis control to address child survival. *Lancet* 2014; **383**: 1605–07.
- 10 Black RE, Levin C, Walker N, et al. Reproductive, maternal, newborn, and child health: key messages from Disease Control Priorities 3rd Edition. *Lancet* 2016; **388**: 2811–24.
- 11 Patterson B, Morrow CD, Kohls D, Deignan C, Ginsburg S, Wood R. Mapping sites of high TB transmission risk: integrating the shared air and social behaviour of TB cases and adolescents in a South African township. *Sci Total Environ* 2017; **583**: 97–103.