

The journey to improve the prevention and management of childhood tuberculosis: the Kenyan experience

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SUMMARY

Child tuberculosis (TB) cases in Kenya, a high TB burden country, constitute more than one tenth of all TB cases. This paper describes Kenya's efforts in the past decade to increase awareness about policy, improve leadership and combat the multiple challenges faced in the diagnosis and management of children presumed to have TB. We describe the increasing advocacy and

involvement of paediatricians and the child health sector with the National TB Programme, and the resulting improvement in leadership, policy, child-specific guidelines and training materials, health worker capacity, and the implementation of prevention and cure of child TB. **KEY WORDS:** paediatric; childhood TB; tuberculosis; guidelines; FDC; country experience

KENYA IS AMONG THE WORLD'S 22 high tuberculosis (TB) burden countries, with the number of TB cases notified (all forms) increasing from 211 in 2000 to 319 per 100 000 population in 2006 (Figure 1).¹ In recognition of this, the Ministry of Health (MOH) stepped up efforts to improve TB control; however, the focus was on smear-positive adults, with minimal attention given to childhood TB, although children comprise 11–13% of cases (Figure 2).¹ TB care was provided largely through the vertical National TB, Leprosy and Lung Disease Programme (NTLP), with minimal interaction between TB clinics and the traditional child out- and in-patient services, through which the majority of sick children, including those with presumed TB, are managed. As a result, most health care workers (HCWs) lacked the confidence to manage children with presumed TB, and up-referrals to paediatricians was the norm, resulting in delayed diagnosis and poor outcomes. In a resource-limited setting, this was especially problematic, as family resources for travel and higher level care are lacking.

In 2006, two paediatricians working in tertiary hospitals, seeing the large number of children presenting with advanced TB disease and experiencing poor outcomes, began attending NTLP technical meetings to raise awareness about and advocate for improvement at all levels in the management of childhood TB. In 2007, the Kenya Paediatric Association organised a whole-day child TB symposium for paediatricians from all over the country and invited the NTLP to participate, thus initiating a

broader interaction between the two bodies. The NTLP responded positively and began to actively seek technical advice from paediatricians in developing guidelines and policy for children.

In 2009, the Kenyan NTLP sent paediatricians along with their own TB officers to the World Health Organization (WHO) workshop on childhood TB in sub-Saharan Africa, and the team developed a roadmap of specific actions to improve child TB. The roadmap was adopted by the NTLP, which appointed a Child TB Lead Officer in 2009 and mandated the setting up of a Child TB Technical Working Group (TWG) in 2010 comprising key leaders, trainers and major actors in the area of child health (paediatricians, medical schools, MOH child health and AIDS [acquired immune-deficiency syndrome] Control Programme development partners). The TWG provided an effective vehicle for strengthening child TB policy, training, guidelines, job aids, awareness, advocacy and resource allocation.

Important successes that followed include the National Strategic Plan of the NLTP (previously silent on child TB) that dealt with paediatric TB for the first time in the 2011–2015 plan, with indicators and resource allocation.² Efforts were made to raise awareness about child TB during 2011 World AIDS Day and 2012 World TB Day. At the 2014 mid-term review of the Strategic Plan, child TB was evaluated as a separate area for the first time, with evaluation of paediatric issues, including diagnostics, treatment, prevention, TB-HIV (human immunodeficiency virus) co-infection, and monitoring and evaluation, leading

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Article submitted 16 April 2015. Final version accepted 19 August 2015.

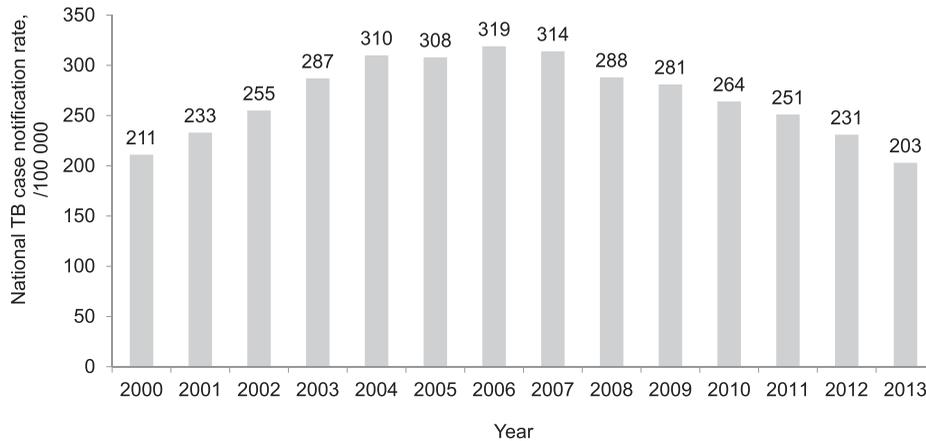


Figure 1 National TB case notification rate (new and recurrent) per 100 000 population, Kenya, 2000–2013. Since 2008, Kenya has achieved high levels of HIV testing (>80% TB cases tested); HIV positivity fell from 43% in 2008 to 37% in 2013.¹ TB = tuberculosis; HIV = human immunodeficiency virus.

to an increased focus on paediatric TB in the new 2015–2018 National Strategic Plan.^{3,4}

Much progress has also been made in assisting HCWs: a separate stand-alone National Guideline Manual on Childhood TB was developed as a coordinated effort between the NLTP, other MOH departments and paediatricians in academia, by adapting the International Union Against Tuberculosis and Lung Disease's 'Child TB Desk Guide' as a guideline for local use. The first edition, published in 2011, was followed by the second edition in 2014.^{5,6} Complementary job aids for use in every child treatment unit were developed, including a simplified diagnostic algorithm for pulmonary TB, drug dosage charts for anti-tuberculosis treatment and isoniazid [INH] prophylaxis and child TB contact management.⁵ Once these guidelines were completed, the need for retraining in-service HCWs was recognised. A Kenyan team of three paediatricians and the MOH Child TB Lead attended a WHO 'Training of Trainers'

course on child TB, and using generic material from this workshop, a 5-day child TB course was developed for local use and published by the NLTP; 25 training of trainer courses were conducted over 2013–2015, in which two or more county and/or sub-county TB coordinators were trained from each of the 47 counties (a total of ~600 trained), who then passed on the training, new guidelines and job-aids in their specific counties to TB clinic and child health service HCWs, including medical officers, clinical officers and nurses. Medical schools are now incorporating this material into pre-service training.

Recent successes in diagnosis include policy revision, allowing patients free of cost access to Xpert[®] MTB/RIF (Cepheid, Sunnyvale, CA, USA) and culture for paediatric sputum and gastric lavage specimens.⁴ Current challenges are the unwillingness on the part of HCWs to collect sputum from children, non-existent sputum induction facilities and skills, parents having to pay for chest radiography (CXR) and inconsistent

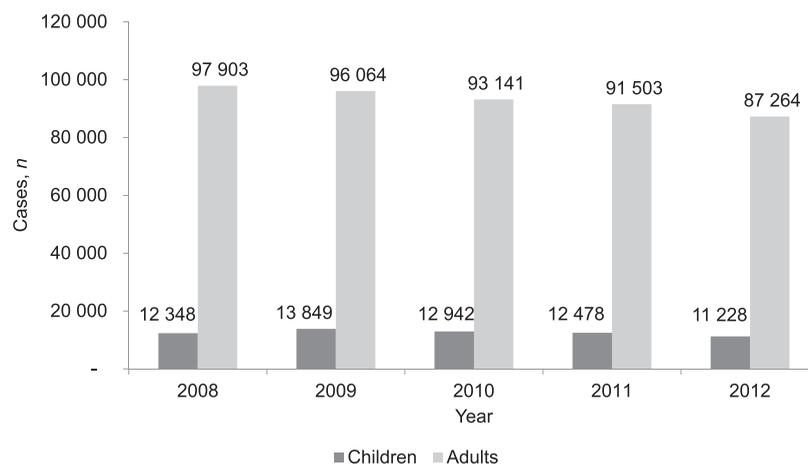


Figure 2 Trends in new child and adult TB cases in Kenya. In 2012, type of TB among children was as follows: no smear 32%, smear-positive 12%, smear-negative 20% and extra-pulmonary 24%.¹ TB = tuberculosis.

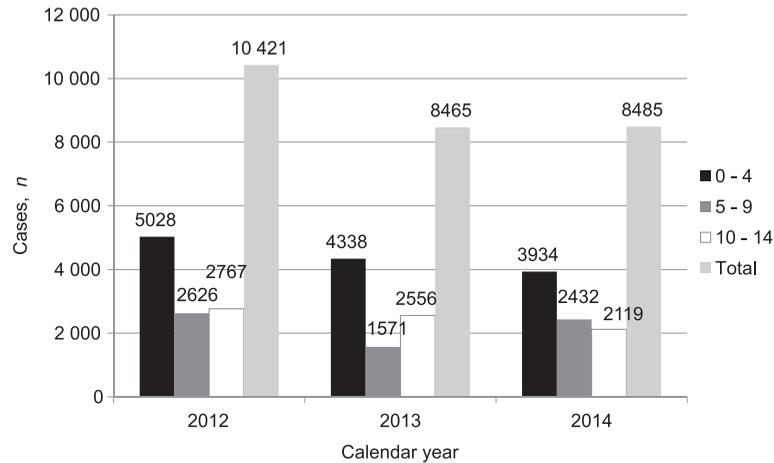


Figure 3 Number of reported child tuberculosis cases in Kenya by age group (in years) during the period 2012–2014.¹

availability of tuberculin. With ongoing training and the current diagnostic algorithm in which investigations (sputum testing, CXR and tuberculin skin test [TST]) are encouraged wherever possible, we hope to see an improvement in this area. The new clinical diagnostic algorithm also empowers HCWs to make a presumptive clinical diagnosis based on suggestive history and physical examination, allowing them to initiate treatment where diagnostic tests are not rapidly available. It is hoped that this will minimise delays in diagnosis and treatment initiation at lower level health facilities.⁵ On the author's request, the NTLN analysed the age groups of child cases recorded over the last 3 years. It should be noted that >50% of paediatric cases are in the 0–4 years age group, the group that poses the greatest challenge to HCWs in terms of diagnosis (Figure 3). A significant decline in the total number of reported child cases was observed between 2012 and 2013–2014, a period during which the Kenyan health services were decentralised, with attendant challenges due to the devolution of TB management to the county level.

Paediatric treatment has long been perceived by HCWs as being complicated due to dose requirements varying with patient age and weight, as well as the existence of multiple regimens. Before 2007, the use of tablets intended for adults posed problems of palatability and acceptability among young children as well as correct dosing, as the tablets had to be split to approximate the dose required. With the introduction of child-friendly chewable fixed-dose combinations (FDCs), palatability improved and dosing using weight-band charts was easier; however, due to multiple different formulations (FDC comprising rifampicin [R] 60 mg, INH 30 mg, pyrazinamide [Z] 150 mg [RHZ], RH 60:60, RH 60:30 and ethambutol 100 mg), HCWs had difficulty in achieving accurate dosages, with resultant stock-outs of one or more of the paediatric formulations, making it even more

confusing to know which combination of adult and/or child tablets to prescribe. Even tertiary-level facilities experienced high levels of incorrect dosing with paediatric formulations.⁷ The revised job aids for drug dosing with clear quantification guidelines developed by the TWG and NLTP have partially improved this situation; however, it will take time to train HCWs in these guidelines and disseminate these widely.⁵ The proposal to develop FDCs containing RH in the ratio of 3:2 so that one RHZ and one RH FDC can be used should simplify dosing as well as quantification and procurement; this should translate into greater confidence in treating children on site, reduce up-referral and improve outcomes.⁸ To adopt these new FDCs, the TWG recently developed a roll-out plan, including fast tracking new FDC local registrations, the development of new treatment guidelines and drug-weight dosage charts, sensitisation and training of HCWs, and setting of tentative dates to phase in new and phase out old FDCs.

Childhood TB can be largely prevented, and Kenya has a policy of contact screening of all children exposed to adults with pulmonary TB; if child contacts are TB symptom screen-negative but at risk of progression (age <5 years and/or HIV-infected, regardless of age), they receive INH preventive therapy (IPT) for 6 months. This policy has been in place for many years; however, uptake is low due to 1) inadequate human resources at both clinic and community level, and 2) lack of confidence and expertise in ruling out active TB among HCWs, who have poor access to TB diagnostic tests for ruling out active TB (TST and CXR), and are therefore hesitant to initiate single-drug INH prophylaxis. In 2015, the Kenyan NTLN developed new implementation tools such as contact screening registers, IPT registers and follow-up cards, which are in early phases of roll-out; INH is also now more widely available.

The integration of current, largely vertical TB

services with other child health services such as maternal and child health clinics in lower-level health facilities and paediatric in- and out-patient units in hospitals is desirable, as this is where the majority of children with TB symptoms will initially present. At policy and guideline level, there is increasing interaction between the NTLP and child health divisions of the MOH. Kenya is currently examining how to decentralise TB services to child health units; however, changing the current paradigm of largely acute care in paediatrics to effective chronic care services will take time, and the system is still in its infancy. However, successful integration of the TB and HIV services has been achieved in ~75% of health facilities, with 93% of adults and 90% of children with TB accessing HIV testing in 2013 (compared to 43% adults tested in 2008), of whom 37% of adults and 29% of children were HIV-positive.^{1,4,9}

This paper describes the Kenyan experience over the past decade in working towards the improvement of health services and care for paediatric TB patients. Kenya has made encouraging strides forward, and has witnessed some decline in child TB, from 13 849 cases reported in 2009 to 11 228 cases in 2012 (Figure 2);¹ however, significant challenges remain in achieving countrywide improvement in all aspects of childhood TB.

Conflicts of interest: none declared.

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R E S U M E

Le Kenya est un pays durement frappé par la tuberculose (TB), où la TB de l'enfant représente plus d'un cas sur 10 de tous les cas de TB. Cet article décrit son cheminement au cours de la dernière décennie afin d'augmenter les connaissances au niveau de la politique et du leadership à propos des nombreux défis affrontés dans le diagnostic et la prise en charge des enfants suspects de TB. Le plaidoyer et une meilleure implication des pédiatres et

des secteurs de santé de l'enfant dans le Programme national TB est décrite et son impact sur le renforcement du leadership, de la politique, des directives spécifiques à l'enfant et du matériel de formation, l'amélioration des capacités du personnel de santé et le renforcement de la mise en œuvre de services préventifs et curatifs pour la TB de l'enfant sont soulignés.

R E S U M E N

Kenia es un país con alta carga de morbilidad por tuberculosis (TB) y los niños representan más del 10% de todos los casos notificados. En el último decenio se ha reforzado la sensibilización de las instancias normativas y directivas sobre los múltiples obstáculos que se presentan en el diagnóstico y la atención de los niños con presunción clínica de TB. A continuación se describen las iniciativas de promoción de la causa y estimulación de la participación de los pediatras y los

sectores de la salud del niño en el Programa Nacional contra la TB y su repercusión en el fortalecimiento del liderazgo, las políticas, las directrices específicas dirigidas a los niños y los materiales de capacitación, el mejoramiento de la capacidad de los trabajadores de salud y la consolidación de la introducción de los servicios preventivos y curativos en materia de TB de los niños.
