to review fewer fields than recommended before declaring a sputum smear negative, but viewing just four fields through the 20× objective will already correspond to the 100 fields required by ZN. Examining one full length of a smear corresponds to 500 ZN fields, and gives the greatest chance for LED FM to fulfil its promise of increased sensitivity.

As with any technology, poor implementation of LED FM may lead to underperformance. Fortunately, each of these pitfalls—hasty and poor training, overreading of scanty smears with ZN, and the use of 40× or even 100× objectives for screening—can be overcome by using better approaches for training and quality assurance. These may vary from setting to setting and with the experience of the microscopist. To date, we have not seen any published studies measuring LED FM proficiency after different lengths of training. Such studies are critical to ensure that scale-up of LED FM achieves the goals of reducing laboratory workload and increasing case detection, without increasing false-positive diagnoses.

Armand Van Deun*†
Adithya Cattamanchi‡§
J. Lucian Davis‡§
John Ridderhof¶
*International Union Against Tuberculosis and Lung Disease
Paris, France
†Institute of Tropical Medicine
Antwerp, Belgium
‡University of California San Francisco (UCSF)
San Francisco, California, USA
§Makerere University–UCSF Research Collaboration
Kampala, Uganda
¶Centers for Disease Control and Prevention
Atlanta, Georgia, USA
e-mail: avandeun@theunion.org
http://dx.doi.org/10.5588/ijtld.12.0407-2

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Change to patient-centred terminology in tuberculosis: an important step, but what about the treatment strategies?

We read with great interest the article of Zachariah et al. and welcome the reflection and recommendation towards more patient-centred terminology in tuberculosis (TB) programmes. The article laudably mentions that the lack of a strong, patient-centred approach to TB services is probably the most important reason for poor treatment completion rates. But will a change in terminology and/or definitions suddenly enhance treatment outcomes?

We are concerned that TB programmes continue to focus mainly on directly observed therapy (DOT) as their recommended method of supervision. DOT has not been shown to improve treatment outcomes compared to self-administered therapy (SAT).[1] While there is increasing emphasis on approaches that allow DOT to become more patient-focused, it still views patients as passive subjects of their treatment programmes. In many settings with a high prevalence of human immunodeficiency virus (HIV) infection and TB that are often challenged with inadequate human resources for health, DOT is neither feasible nor practised. Rather, weeks of TB medication are dispensed to patients with little health education or treatment support. In recognition of this reality, the endorsement of the SAT strategy is critical.

After more than a decade of prescribing antiretroviral therapy (ART), the HIV world has learned much about patient empowerment and its ability to enhance treatment outcomes. Recent interesting strategies include the use of community ART groups (CAGs) in Mozambique,[2] and adherence clubs in Cape Town,[3] where patients are not only educated and prepared, they are also considered co-responsible for the treatment of their illness.

HIV treatment programmes have learned that treatment strategies need not only to be adapted to the reality of patients' daily lives, they should also be owned by them to achieve optimal outcomes.[4] A recent cluster randomised trial in Uganda found that home-based ART delivery was equivalent to facility-based ART delivery in terms of survival and virological suppression.[5] In Eastern Africa, various community models involving people living with HIV support drug distribution and patient follow-up, leading to reduced loss to follow-up.[6]

While the World Health Organization recognises the need to establish mechanisms for delivering integrated TB and HIV services to co-infected patients,[7] only South Africa has created a manual to guide integration.[8] In most settings two separate services continue to exist, with different and sometimes conflicting treatment approaches.

When will we dare to integrate TB and HIV services, especially in settings with high co-infection, and create patient-centred strategies that encourage the participation of patients as responsible, educated partners in their own treatment?

We urge the TB world to move beyond lip-service to a patient-centred approach. Words are important, but evidence-based strategies to accompany them exist and must be implemented.

M. Biot*
P. Saranchuk†
T. Ellman†
H. Bygrave†
M. Bemelmans*
*Médecins Sans Frontières
Operational Centre Brussels
Brussels, Belgium
†Médecins Sans Frontières
South African Medical Unit
Cape Town, South Africa
e-mail: marc.biot@brussels.msf.org
marc.biot63@gmail.com
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Xpert® MTB/RIF diagnosed disseminated smear-negative MDR-TB in a sub-district hospital in India

We report here the first case of disseminated multidrug-resistant tuberculosis (MDR-TB) diagnosed using the Xpert® MTB/RIF assay in a sub-district hospital in India. A 17-year-old boy was initially diagnosed with left-sided pleural tuberculosis (TB) at a regional TB treatment facility. He was started on World Health Organization (WHO) Category I anti-tuberculosis treatment with isoniazid, rifampicin (RMP), pyrazinamide and ethambutol. He improved clinically, with resolution of the pleural effusion. He later reported that he had missed several doses during treatment.

Towards the end of treatment, in September 2010, he developed severe generalised abdominal pain. He had an emergency exploratory laparotomy with appendectomy for presumed appendicitis. Omental biopsy demonstrated granulomatous inflammation with focal caseation, consistent with TB peritonitis. He was then switched to the WHO Category II regimen (streptomycin added). However, the surgical wound didn't heal, with continued daily purulent discharge.

He presented in November 2011 with low-grade fever, fatigue, abdominal pain and ongoing purulent drainage from the abdominal wounds. There were three ulcerated wounds on the abdomen at the prior surgical site. Weight was 35 kg compared to 58 kg in March 2010. The fluid from the wound was negative for acid-fast bacilli (AFB) by Ziehl-Neelsen microscopy. Chest radiograph demonstrated new bilateral upper and mid-lung infiltrates. He was unable to produce sputum for TB testing. He was negative for the human immunodeficiency virus. Fluid from the abdominal wound was tested with Xpert MTB/RIF, a nucleic-acid amplification test for rapid detection of *Mycobacterium tuberculosis* and RMP resistance. The test was positive for TB (*M. tuberculosis* detected very low) and RMP resistance, and a diagnosis of disseminated MDR-TB was made. A specimen from the abdominal wound was sent to another laboratory facility for mycobacterial culture, which was negative.

Based on WHO guidelines and the patient's treatment history, MDR-TB treatment was started with kanamycin, high-dose levofloxacin, ethionamide, cycloserine, amoxicillin/clavulanate and linezolid. He improved rapidly, with weight gain, reduced fatigue and malaise, cessation of discharge, and ultimately complete closure of the abdominal wounds.

Diagnosis of extra-pulmonary TB poses many challenges: clinical presentation can be misleading and the performance of microscopy is generally poor. Moreover, at the sub-district level, the second-line diagnostic tools (i.e., culture and DNA probe assays) are often unavailable and/or expensive. In this case, Xpert MTB/RIF of abdominal fluid allowed a rapid, bedside diagnosis of disseminated, chronic, culture-negative MDR-TB in a patient with multiple differential diagnoses in a resource-limited setting. Early treatment interruption likely contributed to the development of drug resistance, poor clinical response and subsequent dissemination. It took 2 months to receive the culture result, whereas prompt diagnosis by Xpert MTB/RIF saved crucial time and resources by sparing unnecessary trials of antibiotic therapy and delay in initiation of appropriate treatment.

Based on recent studies, Xpert MTB/RIF in specific settings may prove superior to culture in the diagnosis of different forms of TB in terms of sensitivity, cost-effectiveness, and operational feasibility.[1–4]

Kunchok Dorjee*
Fulvio Salvo†
Kerry L. Dierberg‡
*Tibetan Delek Hospital
Dharamsala, Himachal Pradesh, India
†Emerging Pathogens Unit
San Raffaele Scientific Institute
Milan, Italy