are continuously updating this analysis based on a rapidly growing body of data from more than 40 ongoing projects in 14 countries. A policy framework and tools to help implementation have been developed based on field experiences and operational research. Information about WHO's work on private sector involvement in TB control can be found on the web site: http://www.who.int/tb/dots/ppm.

Mahendradhata & Utarini highlight the fact that public–private collaboration for improved TB control takes place in a context of constrained resources and competing interests. Our analysis suggests that government investment is indeed crucial in order to ensure technical capacity-building in the private sector, managerial capacity-building in the public sector, improved supervision and quality control of private providers, and improved surveillance. Public funding is also needed in order to secure a supply of drugs and consumables free of charge to TB patients attending private clinics. While additional investments will be required, cost-effectiveness analysis of two collaborative projects in India has demonstrated that the amounts of such investments would be comparable, on a cost per successfully treated case basis, to those required by the public sector (*3*). From a societal perspective, a significant added value would be a substantial reduction in the financial burden on patients and, potentially, early detection and reduction in transmission of TB.

From documented experiences, what do we already know about why partnerships work? As expected, the determinants of success are precisely the factors that help to counter some of the well-known barriers to collaboration (*4*). First, a genuine commitment on the part of the public sector demonstrating that it is indeed interested in working with private providers; second, justifiable additional investments — human and financial — to help build the collaboration and contribute further to TB control; third, a proper situational analysis to develop a locally appropriate task-mix for public and private providers; fourth, orientation and training of both public and private providers to prepare them to work together; and finally, a built-in monitoring and evaluation system to continue to measure the benefits and to improve upon the collaboration (*2*, *5*).

For Mahendradhata & Utarini's own project, if they intend to apply first what they mentioned first — the strategy of strengthening regulatory structures — then a word of caution is called for. Regulation of private providers is indeed crucial and must be dealt with. To begin with a heavy emphasis on "regulating" providers, however, could turn the project into a non-starter. Experience shows that in public–private partnership building, when to employ a strategy is as important as the strategy itself. This and similar potential stumbling blocks could be avoided if private providers are involved in the process right from the first step of planning an intervention and, more importantly, in a spirit of partnership. ■

Competing interests: The authors work with the Public–Private Mix for DOTS Initiative in the Stop TB Department at WHO.

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Can clinical algorithms deliver an accurate diagnosis of HIV infection in infancy?

Editor – The Integrated Management of Childhood Illness (IMCI) guidelines established clinical criteria to identify children with suspected HIV infection for HIV testing and specific management. In an article published in the *Bulletin*, based on a study conducted in South Africa, Horwood et al. report that they have fine-tuned these criteria into a clinical algorithm (*1*). This algorithm has been incorporated into the 2003 edition of the South African IMCI guidelines to maximize identification of HIV infected children (*1*, *2*). Horwood et al.'s study clinically assessed 690 hospital outpatients, aged 2–59 months, in an HIV prevalence setting of 28.7%. In the absence of screening questions, the clinical algorithm was applied and yielded a sensitivity of 70%, specificity of 80% and a positive predictive value (PPV) of 59%. The validity of the algorithm for the 226 infants (2–11 months), 38% of whom were infected, did not differ from that for the other age categories (*1*).Validation of the clinical algorithm in different settings was invited (*1*).

Vertically exposed infants in prevention-of-mother-to-child transmission (PMTCT) programmes in low-resource settings rely on clinical assessments for HIV diagnosis since infants are first tested at 12 months of age using an HIV enzyme-linked immunosorbent assay (ELISA). The HIV prevalence among infants will vary according to the availability of PMTCT services and the mode of infant feeding. We carried out a study to establish an affordable and accurate diagnostic protocol for HIV using a cohort of 301 infants attending a PMTCT clinic at Coronation Women and Children's Hospital, a secondary- level hospital in Johannesburg, South Africa (*3*). At 12 months of age, the infant's true HIV-infection status was determined using polymerase chain reaction (PCR) testing according to the Centers for Disease Control and Prevention (CDC) guidelines, in conjunction with clinical assessments (*4*). In a predominantly exclusively formula-fed population, 26 patients (8.7%) were HIV positive (*3*). At the visits at 6 weeks and at 3, 7 and 12 months of age, 18 different doctors experienced in local paediatric HIV care and blinded to the HIV test results prospectively diagnosed the infant's HIV infection status based on clinical findings. Two-thirds of all clinical examinations were performed by paediatricians. The clinical findings were recorded on a structured data collection tool

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that concentrated on clinical features derived from CDC clinical guidelines (i.e., recurrent infections, weight gain, candidiasis, lymphadenopathy, hepatosplenomegaly) (*4*). The number of HIV-infected infants who were correctly clinically diagnosed in our study increased with age from 56% at 6 weeks of age to 93% at 12 months of age.

The performance of the IMCI algorithm in our study population was retrospectively assessed by applying our source data to the South African 2003 IMCI clinical algorithm which consists of asking, looking and feeling for eight features of symptomatic HIV without the screening questions (*5*).

The disturbing finding was that the algorithm would have detected only 17% of HIV-infected infants at 6 weeks of age. Even though the detection rate improved to 50% for infants aged 12 months, this was still much lower than the rate of 70% reported by Horwood et al. (*1*). Retrospective application of the IMCI algorithm to clinical data collected by highly skilled personnel therefore yielded particularly poor sensitivity in detecting HIV infection throughout infancy.

A long-term prospective study in Rwanda has documented that HIV-infected children in Africa develop early morbidity and mortality (*6*). In our cohort, all 15 surviving HIV-infected infants available for assessment at 12 months of age were symptomatic and required specific medical interventions, e.g. antifungal treatment for oral thrush. Despite this clinical scenario, eight (53%) of the 12-month-olds would not have been detected by the IMCI algorithm. The high early mortality rate of HIV-infected infants is a further concern, particularly with the increasing availability of antiretroviral therapy. Of the 10 HIV-infected infants who died before their first birthday, 5 (50%) would have remained undiagnosed by the IMCI algorithm. The clinical assessments in our study missed 2 (20%) of these children. Like Horwood et al., we noted that the higher sensitivity of the doctors' clinical assessments was often attributable to the detection of hepatosplenomegaly, which is not included in the IMCI algorithm (*1*).

Clinical diagnosis of HIV infection in infancy remains a challenge. Additional prospective assessments of the IMCI clinical algorithm in vertically exposed infants in PMTCT settings with different HIV prevalence are required. It is a cause for concern that in our PMTCT setting the IMCI algorithm used by highly skilled clinical practitioners only identified approximately half of the infants experiencing HIV-related mortality and morbidity at 12 months of age. In an era of expanding antiretroviral scale-up programmes, clinical assessment remains an unacceptably insensitive diagnostic tool for ensuring that HIV-infected infants access care. A more pragmatic approach may be to invest in assessment of affordable, simple methods of testing for early diagnosis of infants rather than relying on clinical skills alone. ■

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