be 32.5% in the year 2008. India’s poor are at a heightened risk of acquiring non-communicable diseases and their complications, due to lack of basic amenities, poor health-seeking behaviour and lack of social support ensuing in stress. Studies have shown that proper treatment and control of hypertension can reduce mortality.

GPs usually are the first contacts for healthcare in India. It has been reported that almost two-thirds of the population relies on the services of GPs. More often than not, hypertension is first diagnosed by these doctors, and is managed by them for long periods. Hence, it would be worthwhile upgrading their skills in the diagnosis and treatment of hypertension, as per accepted guidelines. Client satisfaction, resulting from controlled blood pressure and less complications, is likely to lead to augmentation of their practice. This should encourage GPs to participate in such training programmes. In rural areas, in addition to doctors in the private sector, medical officers at state-run primary health centres are sought for primary healthcare by the people. Training of these medical officers should also lead to better control of hypertension in the community, leading to reduced morbidity and mortality.

A new band of functionaries, named Accredited Social Health Activist (ASHA), have been identified in the National Rural Health Mission. ASHA is a health activist in the rural community, who is required to create awareness on health and its social determinants. As per the draft document of the National Urban Health Mission of the Government of India, a community link volunteer, Urban Social Health Activist (USHA) is proposed to be identified in urban poor settlements, for community mobilization and enhancing their participation and utilization of healthcare services. With some training, both ASHA and USHA are aptly suited to provide HHE for the control of hypertension in the community.

With the high prevalence of hypertension, and the large number of available GPs and community health workers, the replicability of this model in India deserves attention.

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What sustains the market for TB serodiagnostics in India: A novel analysis


SUMMARY
Serological tests for tuberculosis (TB) lack diagnostic accuracy and WHO has advised against their use. Although not used by the Revised National Tuberculosis Control Programme (RNTCP), serodiagnostics are widely used in the private sector in India. The authors carried out a root-cause analysis to find out why serological tests are so popular and identified seven root causes, which they classified into three categories: technical/medical, economic and regulatory. The current budget of the RNTCP is too low to allow for scale-up to the newer, WHO-endorsed technologies. The authors point out that under the RNTCP, most patients have access to only smear microscopy, a test that is insensitive and underused in the private sector. Because there is no accurate, validated point-of-care test for TB, serological tests meet a perceived need among doctors and patients. Most patients cannot afford imported molecular or liquid culture tests and this, together with the fact that the Indian market does not offer affordable Indian versions either, creates a lucrative market for serological tests. Although serological tests lack accuracy, doctors, laboratories and industry profit from their use. This is reflected in the fact that more than a million serological tests are being done in India every year. Finally, TB tests are poorly regulated and a large number of serological kits are on the market. Doctors in the private sector are outside the scope of the RNTCP and are not required to adhere to the standard guidelines. The authors argue that a clear understanding of these realities can facilitate the formulation of market-based strategies that can help replace serological tests with accurate, validated tools.

COMMENT
Worldwide, TB affects nearly nine million people every year and about two million people die from the disease. In India, every year, about two million people develop incident cases and over 10 million TB suspects need diagnostic testing, such as sputum microscopy, mycobacterial culture, chest radiography and nucleic acid amplification tests. The decision to choose one test over another should be, but is often not, based on accuracy and reliability, logistics and cost. Sputum microscopy, the oldest and most widely used test, misses half of all TB cases. Cultures take time. Nucleic acid amplification tests are expensive and not available in primary care. Serological tests occupy the middle slot in TB diagnostics—these tests are costlier than sputum microscopy,
but cheaper than culture and molecular tests. They generate high revenue in India: the Indian private healthcare sector offers 13 types of serological test kits and about 1.5 million patients undergo serological tests for active TB, at a cost of over US$ 15 million. India is not the only high-burden country where TB serodiagnoses are being misused. A recent paper shows that the problem extends to other high-burden countries such as China, Indonesia, Pakistan, Vietnam and Uganda as well.

Can the accuracy of these assays justify their widespread use in India? Published evidence suggests that serological tests are not accurate enough to distinguish TB from disorders that mimic TB. In 2010, WHO commissioned an updated systematic review to evaluate the diagnostic accuracy of commercial serological tests for pulmonary and extrapulmonary TB, with a special focus on the relevance of these assays in low- and middle-income countries. In this review, Steingart and colleagues concluded that commercial serological tests lack accuracy. Most studies lacked methodological rigour, were either sponsored by industry, involved commercial test manufacturers, or failed to provide information on industry sponsorship. The findings from this systematic review were used as the input for a study on the cost-effectiveness of serological testing for active TB in India. In July 2011, WHO issued a policy statement calling for a global ban on the use of commercial serological tests for pulmonary and extrapulmonary TB because these tests provided inconsistent and imprecise estimates of diagnostic accuracy, failed to impact patient-important outcomes, and had an adverse impact on the patient’s safety. The WHO added that the commercial serological tests currently available on the market are not approved or regulated by any recognized body, and that most are manufactured in Europe and North America.

Let us see how this evidence applies to diagnosing TB in primary care. A hypothetical case may explain why serological tests should not be used for TB diagnosis in healthcare. Based on history and physical examination, a primary care physician estimates that a symptomatic outpatient in her setting would have a chance of about 1 in 5 of having TB (pre-test probability of 20%). She orders a serological test to confirm or rule out TB. She wants a positive test to accurately rule in TB (post-test probability of about 95%) and a negative test to rule it out (post-test probability close to 0). The product insert of the test mentions that the test is 80% sensitive and 80% specific. The test generates a positive likelihood ratio (LR+) of 4 and a negative likelihood ratio (LR−) of 0.25 (sample size 100; prevalence of TB 20%; sensitivity 80%; specificity 80%). Given these characteristics of the test, a patient who tests positive would have a 50% probability (95% CI 33%–66%) of having TB; the post-test probability would be about 6% (95% CI 3%–15%) if the patient tests negative. These numbers are disappointing: the physician cannot rely on a TB serological test for accurately ruling in or ruling out TB in her setting. She must know that the false-negative results could result in patients suffering from chronic TB, dying from untreated TB or transmitting the disease to others. Similarly, the false-positive results could lead to unnecessary treatment, while the real cause of the patients’ illness may remain undiagnosed. In addition, false-positive results may result in serious adverse events: more tests, inappropriate therapies, avoidable anxiety and costlier healthcare.

Although physicians naively believe that serological tests could serve as a good substitute for sputum microscopy, and indeed be superior, the published evidence clearly shows that these tests cannot replace sputum microbiological tests. Compared to microscopy, serology would yield 14,000 additional diagnoses of TB, but would also generate 121,000 additional false-positive diagnoses. Also, for each additional smear-negative TB case diagnosed by serology, more than six additional false-positive cases would be inappropriately diagnosed.

Jaroslawski and Pai lament that despite the proven lack of accuracy of serological tests for TB, these tests continue to enjoy popularity in the Indian market. To understand why high-quality evidence has not resulted in the appropriate use of these tests, the authors made a root-cause analysis (RCA). They identified seven ‘I’s that explain the misuse of serological tests in general practice: Ignorance, Ineptitude, Incentives, Inefficiency of regulatory board, Inaccuracy of sputum microscopy, Inadequate funding of national programmes and perceived superiority of Immunological tests over simple sputum test. The authors rightly point out that Indian physicians naively believe that serological tests are highly accurate, and also use them to convince their patients that their diagnosis and treatment are based on sophisticated evidence. Compared to sputum microscopy, serological tests appear attractive to physicians because their turnaround time is short, they obviate the need for a second sample and they generate evidence in situations in which patients cannot produce sputum or are suspected to have extra-pulmonary TB. These notions, the paper argues, are not evidence-based.

Irrational diagnostic testing is common worldwide. For example, orthopaedic surgeons routinely use MRI to assess non-specific acute low back aches, physicians always include stress tests in the annual health check-up plan to diagnose coronary artery disease and urologists order prostate-specific antigens for screening for prostate cancers. None of these tests has ever been shown to result in better outcomes.

Two recent initiatives deserve attention, which aim at generating lists of evidence-based activities to improve the quality of healthcare and save resources that can promote rational medical practice. One is ‘Choosing Wisely’, an initiative of the American Board of Internal Medicine (ABIM) Foundation. This encourages physicians, patients and other stakeholders in healthcare to think and talk about medical tests and procedures that may be unnecessary, and may even be harmful. Nine specialty societies created lists of ‘Five things physicians and patients should question’. The lists consisted of evidence-based recommendations that should result in evidence-based decisions about the most appropriate care based on a patient’s individual situation.

Second, the American College of Physicians (ACP) recently convened an ad hoc work group of experienced internal medicine physicians to identify common screening and diagnostic tests that they believe are frequently overused. The work group identified 37 commonly misused screenings and tests that can increase the cost of healthcare, lead to unnecessary further interventions and even harm patients.

I think that serological tests for TB need to be added to the list of potentially useless tests. The time is ripe for physicians to learn and apply the principles of evidence-based care in their practice, principles that would lead to significant health benefits and reduce risks, harm and costs. We need TB tests that are faster, cheaper, better, simpler and much more accurate than the existing diagnostics, but serological tests cannot be used to fulfill these aims. Healthcare professionals have an ethical obligation to do away with a multi-million-dollar business that focuses on selling substandard TB serological tests, tests that can result in misdiagnosis, mistreatment and harm to public health. Thankfully, the Ministry of Health and Family Welfare in India has taken a decision to ban commercial TB serological tests. This is a big step in the right direction.
HPV vaccination: More evidence of benefit

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SUMMARY

This study aimed at evaluating cancer and low- and high-grade cervical abnormalities after the introduction of the national human papilloma virus (HPV) vaccination programme with the quadrivalent vaccine (Gardasil) in Victoria, Australia for all women 12–26 years of age during 2007–2009. The vaccination programme consisted of a continuing component that targets 12–13-year-old girls in schools and two catch-up programmes, one for 13–17-year-old school girls and the other for 18–26-year-old women through general practice and community settings delivered between July 2007 and December 2009. A telephone-based survey indicated that the programme achieved a coverage of 74% for one dose, 69% for two doses and 56% for three doses. The programme includes one of the broadest funded catch-up range in the world. This vaccination programme overlaps with the national cervical cancer screening programme of Australia established in 1991. It recommends one cervical cytology test every 2 years, beginning at the age of 18 years (or 2 years after the onset of sexual activity, whichever is later) until the age of 69 years.

There is a rapid effect on infection with vaccine-targeted HPV types after the implementation of the population-based HPV vaccination programme. However, because of the long lead time between infection and its malignant transformation, the programme’s effect on cancer will need decades to assess. This study reported cervical abnormality rates in young women in the first 3 years after the national HPV vaccination programme as these cervical abnormalities are more proximal.

The data were extracted from the Victorian Cervical Cytology Registry (VCCR) for all screening-related episodes between 1 January 2001 and 31 December 2009. Data were analysed to determine whether the incidence of cervical abnormalities changed after the introduction of the HPV vaccination programme in April 2007 compared with 4 years before its introduction. Cytopathologically defined high-grade abnormality (HGA) was the primary outcome measure and low-grade abnormality (LGA) was the secondary outcome measure. An LGA or HGA outcome was regarded as incident if it was a woman’s first LGA or HGA diagnosis, or a woman’s first abnormality that occurred at least 2 years (730 days) after a previous abnormality, with at least two negative tests in the intervening period. Incidence rates were defined as the number of incident events per 100 women tested within 3 months. Incidence rates were estimated for 3-month periods and stratified by five age groups which had different exposure to vaccination: women of age ≤17 years, 18–20 years, 21–25 years, 26–30 years and ≥31 years) and two periods: before vaccination (1 January 2003 to 31 March 2007) and after vaccination (1 April 2007 to 31 December 2009). Comparisons between the two periods for each age group were done with Fisher exact test.

Lowess smoothing (bandwidth 0.5) was used to show incidence trends over time. A quantitative comparison of HGA temporal trends before and after vaccination was done with piece-wise Poisson regression analysis. In the context of a constant trend, the incidence rate ratio (IRR) was used as a measure of proportional change in incidence rate within a 3-month period. IRR was used to estimate the ratios of slopes for temporal trends before and after vaccination. Stata SE (version 10) was used to do all statistical analyses.

A decrease in LGA incidence was recorded in age groups 21–25 years, 26–30 years and ≥31 years. There was no decrease in LGA incidence in those younger than 18 years of age or those 18–20 years of age after the introduction of the HPV vaccination programme.

There was a significant decrease of 0.38% (95% CI –0.61–0.16; p=0.003) in the incidence of HGA in women ≤17 years of age, beginning shortly after the introduction of the HPV vaccination programme, with a reduction from 0.85% in 2006 (the year before vaccination) to 0.22% in 2009 (p=0.003). There was no significant change in the incidence of HGA in women 18–20 years of age. Small increases in incidence were seen in women 21–30 years of age (0.17%–0.18%, 95% CI 0.10–0.26; p=0.001) and in those ≥31 years of age (0.02%, 95% CI 0.01–0.04; p=0.002). There was a significant progressive linear decrease in the incidence of HGA after the introduction of the vaccination programme in girls ≤17 years of age but in those 18–20 years of age, the HGA incidence trend after the introduction of vaccination was non-linear, and the decline was smaller and delayed.

COMMENT

The discovery that persistent infection with oncogenic HPV is the cause of cervical cancer and the long precancerous phase has