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Programmatic approaches to screening for active tuberculosis

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SUMMARY

Passive case finding, the detection of tuberculosis (TB) cases among persons presenting to health facilities with symptoms suggestive of TB, has remained the principal public health approach for TB diagnosis. While this approach, in combination with improved treatment, has led to substantial global progress, the overall epidemiological impact has been inadequate. Stagnating case notifications and sluggish decline in incidence prompt the pursuit of a more active approach to TB case detection. Screening among contacts of TB patients and people living with human immunodeficiency virus infection, long recommended, needs scaling up. Screening in other risk groups may also be considered, depending on the epidemiological situation. The World Health Organization (WHO) has recently produced recommendations on systematic screening for active TB, which set out principles and provide guidance on the prioritisation of risk groups for screening and choice of screening and diagnostic algorithms. With a view to help translate WHO recommendations into practice, this concluding article of the State of the Art series discusses programmatic approaches. Published literature is scanty. However, considerable field experience exists to draw important lessons. Cautioning against a hasty pursuit of active case finding, the article stresses that programmatic implementation of TB screening requires a systematic approach. Important considerations should include setting clear goals and objectives based on a thorough assessment of the situation; considering the place of TB screening in the overall approach to enhancing TB detection; identifying and prioritising risk groups; choosing appropriate screening and diagnostic algorithms; and pursuing setting-specific implementation strategies with engagement of relevant partners, due attention to ethical considerations and built-in monitoring and evaluation.

KEY WORDS: TB screening; active case finding; programmatic approaches

CONCERTED EFFORTS over the last two decades, first under the DOTS strategy and later the Stop TB Strategy, have helped make remarkable progress in global tuberculosis (TB) control. TB-related Millennium Development Goal targets have been achieved in advance, and the global TB epidemic has now been halted and begun to reverse.[1] However, the persisting burden —8.7 million new TB cases and 1.4 million TB deaths annually, and the slow decline of TB incidence at about 2% a year—calls for a redoubling and transformation of current efforts. Enhanced action should also address the enormous socio-economic burden that the poor have to bear as a consequence of the disease.[1,2]

In the absence of a truly effective vaccine, diagnosing and treating active TB has been the principal public health strategy for TB control.[3] Under the DOTS strategy, countries strived to meet the recommended targets of detecting 70% of the estimated cases and curing 85% of them. The Stop TB Strategy, adopted in 2006, recommended a greatly enhanced scope and

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reach of TB control programmes towards these goals.[4] Passive case finding, which is the detection of TB cases largely from among those presenting themselves to health facilities with suggestive symptoms, has until recently remained the principal approach.[5] The persisting TB burden and its socio-economic consequences prompt the pursuit of a more active approach to early TB detection to minimise disease transmission and further improve treatment outcomes—hence the need to consider systematic screening for active TB as a critical part of the next phase in TB care and prevention.

The previous articles in this series have covered important aspects of systematic TB screening, including definition and rationale,[6] benefits of active case finding,[7] current approaches to case finding in low-incidence countries,[8] methodological challenges in implementing and evaluating TB screening programmes[9] and experiences and evidence on screening in high human immunodeficiency virus (HIV) prevalence settings.[10]

Since this State of the Art series was launched, the World Health Organization (WHO) has finalised the guidelines on systematic screening for active TB, which set out principles and provide recommendations on the prioritisation of risk groups and choice of screening approaches.[11] These recommendations are summarised in the Table. The principles are presented in the first article of this series.[6]

This final article discusses programmatic approaches to systematic screening for active TB, with a focus on high-prevalence countries. The following section highlights the main conclusions of previous articles, while section three discusses the place of TB screening in the overall approach to increase case detection. Published literature on programmatic application of systematic TB screening is scanty; some of the available experiences are discussed in section four. Based on existing knowledge and experiences, the article concludes by outlining important considerations in implementing systematic TB screening programmes in high TB prevalence settings.

HIGHLIGHTS FROM PREVIOUS ARTICLES

In the first article of this series, Lönnroth et al. elaborate concepts and considerations related to TB screening.[6] Systematic screening for active TB is defined as 'systematic identification of people with suspected active TB in a predetermined target group using tests, examinations or other procedures which can be applied rapidly'. Active case finding connotes undertaking screening outside health facilities through outreach programmes, which may be for TB only or may piggyback onto other screening programmes.

The second article, by Kranzer et al., discusses available evidence on the benefits of active screening.[7] Systematic screening may help detect more cases, and detect them early. There is no conclusive evidence that treatment outcomes among cases detected through

Table Summary of the WHO guidelines on systematic screening for active TB

Recommendations on risk groups to screen

Indiscriminate mass screening is very resource-demanding, has uncertain benefits and should be avoided.

The following risk groups should always be screened for active TB, in all settings:

- Close contacts of people with TB (as per existing WHO guidelines);[12]
- PLHIV (as per existing WHO guidelines);[13]
- Workers in silica-exposed workplaces.

Other risk groups should be prioritised for screening based on national and local TB epidemiology, health systems capacity, resource availability and feasibility of reaching the risk groups. Risk groups to consider include:

- People in prisons and other penitentiary institutions;
- People with untreated fibrotic CXR lesion;
- People in high TB burden settings (estimated TB prevalence >100/100 000 in the general population) who are seeking care or who are in care and belong to selected risk groups. Within this category, further prioritisation is required of people with the following risk factors/markers, depending on local epidemiology and capacity: diabetes, undernutrition, smoking, alcohol dependence, intravenous drug use, older age, pregnancy, previously treated TB, solid organ transplantation, chronic renal failure/haemodialysis, malignancy, other immune-compromising disorders and people receiving immune-modulatory therapies. Health care workers should also be invited when screening is done within health facilities.

Systematic screening may also be considered for geographically defined sub-populations with extremely high levels of undetected TB (>1% prevalence), and for other sub-populations with very poor health care access, such as urban slum dwellers, homeless people, people living in remote areas, indigenous populations, migrants, and other vulnerable groups.

Screening and diagnostic algorithm options

Options for initial screening test or procedure include symptom screening (either screening for cough for >2 weeks or screening for any symptom compatible with TB, including cough of any duration, haemoptysis, weight loss, fever, or night sweat), or screening with CXR. CXR is more sensitive than symptom screening, but also more resource-demanding. If symptom screening is used as the initial screen, CXR can be used as a second screen to further improve the pre-test probability of the subsequent diagnostic test and to reduce the number of people that need to undergo further diagnostic evaluation. Different algorithms are available for adults and children. The existing screening and diagnostic algorithm for PLHIV infection should be followed for this group of people.[13]

Each algorithm for adults includes options to use either sputum-smear microscopy or a rapid molecular test with demonstrated high accuracy for both smear-positive and smear-negative pulmonary TB, such as Xpert® MTB/RIF (or any future WHO-recommended rapid test with the same or better accuracy), as the initial diagnostic test for persons screened positive.[14] Positive or negative diagnostic test results may require a repeat test or further diagnostic evaluation with culture, drug-susceptibility testing and/or clinical assessment. Culture with drug-susceptibility testing should be done in line with existing guidelines for diagnosis of drug-resistant TB.[15]

The algorithms have different cost, human resource and health systems requirements. The choice of screening and diagnostic algorithm depends on the risk group, TB prevalence, resource availability and feasibility. The algorithms have different sensitivity and specificity and therefore different yield of true- and false-positive and -negative cases (estimated yields of different algorithms are available in the guidelines). The yield also varies with TB prevalence in the screened population. The risk of a false-positive diagnosis increases with declining prevalence, for all algorithms. It is of particular importance to minimise risk of false-positive diagnosis in provider-initiated screening. Special attention to the diagnostic accuracy is therefore required, particularly when the TB prevalence in the screened population is less than 1%.

WHO = World Health Organization; TB = tuberculosis; PLHIV = people living with human immunodeficiency virus; CXR = chest radiograph.

screening approaches are any better than or inferior to those detected through passive case finding. It is unclear if screening has an impact on TB epidemiology.[7]

Reviewing evidence from low-burden settings and highlighting successes of active case finding among high-risk groups, the third article, by Zenner et al., concludes that while the effectiveness and cost-effectiveness of active case finding among the homeless has been demonstrated, the evidence for screening among migrants is less compelling and requires further research.[8]

The fourth article, by Golub et al., sets the scene for monitoring and evaluation of screening initiatives. Informed and justifiable choices have to be made with regard to the need to measure and document outcomes and impacts.[9] A properly monitored TB screening programme would maximise the chances of achieving success, and demonstrating the success could help expand the programme, sustain it and stop it when appropriate. It would also contribute to the global evidence base on screening for active TB.

In the fifth article of the series, Corbett et al. present experiences and evidence that help make a case for active case finding for TB in high HIV and high TB prevalence areas and modalities thereof,[10] building on the existing WHO guidelines on systematic TB screening among people living with HIV infection (PLHIV).[16]

THE PLACE OF SYSTEMATIC SCREENING IN ENHANCING TUBERCULOSIS CASE DETECTION

Systematic screening is not a new concept in TB control. Mass radiography for active case finding was a common approach in high-income countries in the 1950s and 60s, but was discontinued in most places as the TB burden fell due to diminishing yield and questionable impact. The prohibitive costs and weak public health infrastructure made mass radiography unsuitable for low-income countries.[13] Two landmark studies from Asia in the early 1960s provided the basis for passive case finding as the priority approach to case detection in countries with a high prevalence of TB. Both studies showed that over two thirds of patients with active TB were aware of their symptoms and that over half of them had sought health care on their own. Often, it was the provider they sought care from who failed to detect their disease.[17,18]

The relevance of these studies has not diminished with the passage of time. Hasty pursuit of systematic screening without proper planning and without first addressing the known constraints to case detection may not result in early detection of additional TB cases. On the other hand, well planned systematic screening has the potential to minimise avoidable delays in diagnosis and initiation of treatment. The cost of screening, especially as an outreach activity, can be very high in relative terms, and the opportunity cost as compared to other efforts to improve early TB detection, such as by improving access to diagnostic services and effective treatment, should be considered.

Based on evidence and country experiences, a WHO overview of ways to enhance early case detection presents two complementary approaches: the widely practised patient-initiated pathway, conventionally labelled as passive case finding, and the provider-initiated pathway of systematic screening, including active case finding through outreach activities (Figure).[19] Pursuing interventions to optimise the patient-initiated pathway should remain the primary approach to enhancing case detection, supplemented by the provider-initiated approach of systematic screening in well-identified settings as a secondary approach. Considerable scope remains to greatly enhance early case detection in almost all settings using the prevailing approaches of case finding. These include training and equipping all health workers, including public and private care providers and community volunteers;[20] scaling up Practical Approach to Lung Health;[21] enhancing the quality of sputum smear microscopy; improving the diagnosis of smear-negative TB, extrapulmonary TB and TB among children;[22] setting up and scaling up new diagnostics such as Xpert® MTB/RIF (Cepheid, Sunnyvale, CA, USA);[23] providing access to chest radiography (CXR) services and improving referral and notification by all care providers.[20] Revisiting the definition of a person with suspected TB and broadening the scope through a shorter recommended duration of cough or by inclusion of other suggestive symptoms may also contribute to enhancing case detection. The main criterion currently used —cough of ⩾2–3 weeks—is a compromise that is neither precise in definition nor uniformly applied across country settings. The optimal criteria for defining suspected TB will need to be based on several factors, including disease prevalence, various constellations of associated symptoms, CXR abnormalities and presence of TB-associated risk factors.

Other important interventions to address barriers to accessing TB care include community engagement, awareness generation, and providing free or affordable care, thereby helping to eliminate direct and indirect costs to the patients and addressing the needs of vulnerable groups through strengthening primary health services and additional outreach services catering to these populations. Interventions that combine passive case finding and systematic screening may include intensifying the identification of TB in clinical risk groups such as PLHIV, people with diabetes, malnutrition, harmful alcohol use and silicosis.[20] While intensifying known approaches is essential and important, evidence from prevalence surveys and other research suggests that the primary approach of passive case finding alone may not suffice to detect all persons ill with TB in time or to minimise disease transmission.[2,7,20]

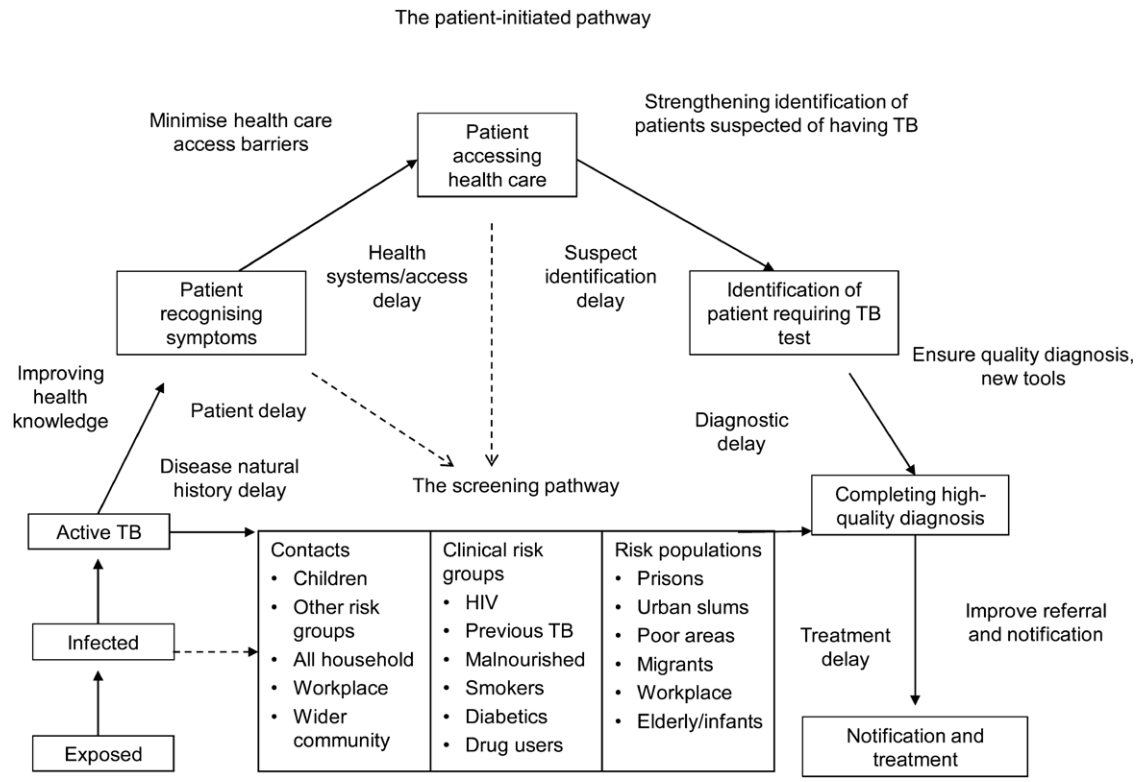

Figure Pathways to TB care with barriers and interventions to improve case detection. TB = tuberculosis; HIV = human immunodeficiency virus.

RECENT EXPERIENCES OF SYSTEMATIC TUBERCULOSIS SCREENING

Attempts to enhance TB case detection through screening have included a range of context-specific approaches along a spectrum of interventions. These range from introducing a screening element into passive case finding, to implementing a comprehensive outreach programme for active case finding. The scalability and epidemiological impact of most of these approaches need to be further examined.

At one end of the spectrum are initiatives enhancing passive case finding through information and education to the targeted communities, combined with decentralised diagnostic services at well-advertised health facilities, and some elements of systematic symptom screening as part of community outreach activities.[24–26]

Further along the spectrum are initiatives that have introduced systematic screening within health facilities, sometimes combined with new diagnostic tools such as light-emitting diode fluorescent microscopy and Xpert MTB/RIF, either in selected clinical risk groups, such as people who are under care for diabetes,[27] or more broadly among all people seeking care in general hospitals or with private providers.[28]

Attempts that fall towards the other end of the spectrum include community outreach programmes to systematically screen household and other close contacts,[29] and special programmes for prisons[30] or mines.[31] An exhaustive approach falling on the very end of the spectrum would be to reach out to every household in a target population at regular intervals,[32,33] or focusing on neighbourhoods around recently diagnosed TB cases.[34]

Recent experiences of ways to implement systematic screening using diverse approaches across the spectrum are highlighted below. The tools used for screening and diagnosis of TB are crucial in determining the efficacy of systematic screening. The age-old tools at the disposal of TB programmes—symptom screening, analogue CXR and sputum smear microscopy—have recently been complemented by expanded symptom screening definitions, digital CXR and a rapid molecular diagnostic test that has the potential to bring about a step change in early TB detection and further enhance the effectiveness of TB screening, as is apparent in some demonstration projects referred to below.

Several of the initiatives outlined below were supported by TB REACH, a multi-country initiative promoting innovative ways to improve TB case finding with support from national TB control programmes.[35] All of these projects were subjected to independent monitoring and evaluation.

In-facility tuberculosis screening

Swaziland

After scaling up TB screening in PLHIV countrywide, in 2010 Swaziland started to expand TB screening to all people attending general out-patient departments (OPD) in 32 hospitals and other medium and large

health facilities. 'Screening officers' were recruited to systematically interview all OPD attendees about TB symptoms before seeing the OPD physician. A screening register was introduced and any person with any of the following symptoms: cough of any duration, fever, weight loss, nights sweats or chest pain, was offered an Xpert MTB/RIF test. In 2012, as many as 251 867 persons were screened, of whom 14 998 (6%) screened positive and were tested using Xpert. Among those tested, 1254 (8.4%) were bacteriologically confirmed and an additional 245 non-confirmed TB cases were notified. Screening in OPDs contributed about 17% of all notified cases nationally in 2012. The number needed to screen (NNS) with symptom screening to detect a case of TB was 168. Interestingly, in this country with extremely high HIV prevalence and the highest estimated TB incidence in the world, the total absolute screening yield in general OPDs was much higher than that from comprehensive screening in antiretroviral therapy and voluntary counselling and testing clinics (1499 vs. 173), and the sputum positivity ratio among those tested was similar. The analyses of the impact of this initiative on overall case notification and cost per detected case are ongoing.*

Afghanistan

In a TB REACH-supported project, health teams systematically screened 889 120 clinic attendees in 47 health facilities as one of the interventions. All attendees were screened for TB symptoms at every visit. A total of 22 228 people were tested with smear microscopy in the health facilities. The intervention found 1986 sputum smear-positive cases in the health facilities. Overall case notifications under the project, which also included 358 cases found through mobile outreach camps for internally displaced populations, increased by 81% during the intervention.

Pakistan

Another TB REACH-supported project in Karachi, Pakistan, used private practitioners and community lay workers to screen 469 896 people attending 54 private clinics and a hospital run by a nongovernmental organisation (NGO) over 1 year. Mobile phones were used to offer incentives to community health workers and enhance reporting. The intervention tested 1.8% of those attendees (those with TB symptoms) and diagnosed 2416 cases of TB, almost four times more than the year before in the same administrative areas.[36]

Screening of household contacts and high-risk groups

The Moroccan experience of contact investigation shows how to put WHO guidelines on contact investigation into practice:[37] first, national operational guidelines were established providing clear definitions of an index TB case and contacts, and instructions on who should be investigated and how. Standard operational procedures were developed for different health staff at the primary and referral levels. Importantly, a standardised data collection form was established to enable monitoring and evaluation. Data collected on a routine basis over many years show that almost 80% of identified household contacts are assessed for active TB, 2.5% of assessed contacts have active TB and contact investigation contributes, on average, to 5.5% of the annual notification of the total number of active TB cases; this contribution increases to almost 20% in children aged <10 years.[12]

Screening in prisons

Mongolia has implemented intensified TB care and prevention in the prison system since 2002. This includes systematic entry screening, proper treatment of TB cases and improved living conditions. Pretrial detainees are screened with fluorography, symptom screening and physical examination. All those with suspected TB undergo a sputum smear microscopy examination. Prisoners are screened again after sentencing using the same procedure. The TB notification rate among prisoners progressively declined from 2500 cases per 100 000 population in 2001 to 900/100 000 in 2010.[38]

Outreach tuberculosis screening

Ethiopia

A TB REACH-supported project in the Sidama Zone of Ethiopia used community-based, government-employed health extension workers (HEW) to systematically find people with TB symptoms, collect sputum and prepare slides for testing. About 1200 HEW identified and collected sputum from 49 857 people with suspected TB and confirmed 2262 cases of smear-positive TB, doubling the number of people put on treatment in the entire zone from the year before. In addition, the HEW provided treatment support, and treatment success improved from 77% to 95% in the area from the previous year.[39]

Cambodia

The National TB and Leprosy Programme, with support from TB REACH, conducted a hybrid approach to contact investigation, active case finding and mass screening, based on experiences from the prevalence surveys conducted over the past 15 years. Mobile teams were deployed in areas of low access to health services for a mass screening day promoted by community workers. Household contacts of people diagnosed with TB over the last 2 years were encouraged to attend the screening, as were others with chest symptoms. Screening was open to all. At the mobile camps, TB symptom information was elicited and all underwent a free CXR. Those with suggestive

*This project was a part of a WHO multi-country initiative on intensifying case detection supported by the Canadian International Development Agency.

symptoms or an abnormal CXR were then tested directly with Xpert MTB/RIF. Over a year, the project screened 35 021 people and tested 3097 people with Xpert: 768 (23.6%) tested positive, representing 5% of all bacteriologically positive patients in the country (15 812 in 2011).

To help inform the development of evidence-based policies on TB screening, most of the above initiatives with encouraging results need to be examined further with regard to their scalability, feasibility, sustainability and their epidemiological and socioeconomic impact.

An example of a strategic national approach to tuberculosis screening

Based on the findings in the 2009–2010 TB prevalence survey, pilot projects and operational research on TB screening, Myanmar has taken a strategic approach to intensified case finding, including screening in high-risk groups. The prevalence survey estimated the prevalence of bacteriologically confirmed TB at 434/100 000 in all age groups combined, and the prevalence of smear-positive TB at 172/100 000. The prevalence was higher in urban than in rural areas, higher among men than among women and higher among the elderly than among young adults. Among adults in urban areas, the prevalence was close to 1%. The prevalence rate was also higher in rural areas dominated by ethnic minority groups with poor access to health care services. The survey also found that applying the standard TB suspect criteria (cough >2 weeks) and performing only sputum smear microscopy for TB suspects would have detected only 13% of all bacteriologically confirmed cases, and only a third of the smear-positive cases.[40]

Building on a well-functioning TB programme that has already successfully engaged a wide array of public and private health care providers, Myanmar has made plans for scaling up TB screening as part of the 5-year strategic plan for 2011–2015.[14] The following activities are detailed in the strategic plan:

1 Increasing the index of suspicion of TB among people seeking care and introducing a more systematic approach to the identification of people with suspected TB through rigorous symptom screening in hospital OPDs. This will be combined with systematic screening using CXR, where possible, for all health care attendees who 1) are over the age of 50 years, 2) have a TB contact history, 3) have previously had TB, or 4) have diabetes mellitus. TB screening in antenatal care services is also planned.
2 Continuing the scale-up of intensified case finding in PLHIV.
3 Scaling up systematic contact investigation which, in 2011, was only done for 19% of index cases.
4 Scaling up systematic entry CXR screening in prisons, based on early pilot reporting notification of about 1500/100 000 from symptom-based screening and smear microscopy-based diagnoses.
5 Employing mobile CXR clinics focusing on poor urban areas and remote villages with very poor access to health services. During the piloting of mobile CXR clinics in 2011, in which people with chest symptoms were invited for screening, a total of 7679 persons were investigated with CXR, of whom 4207 (55%) had CXR abnormalities suggestive of TB, and 654 were diagnosed with TB (8.5% of those investigated with CXR). In scaling up this activity, the Myanmar National TB Control Programme will broaden the criteria for invitation to screening. A move from conventional to digital CXR is planned, and Xpert MTB/RIF will be the predominant test used for TB diagnosis in line with the national scale-up plans for Xpert and programmatic management of multidrug-resistant TB.
6 Exploring screening in mining industries: systematic screening in other occupational settings is not a priority, as a 2007 study found that TB prevalence among workers in different industries was no different than in the general population. Collaboration with corporate sector health facilities for improved passive case finding and TB management is already part of the TB control strategy.

While in-country proof of concept exists for several of the above activities planned in Myanmar, a number of operational, logistical, financial and human resource challenges have been identified. These will be continuously assessed and addressed, while operational research is planned to closely monitor the uptake, yield in relation to inputs and contribution of screening to overall TB notification.

PROGRAMMATIC IMPLEMENTATION OF SYSTEMATIC TUBERCULOSIS SCREENING

Recent screening initiatives provide some insights into planning, implementation and monitoring of systematic screening for TB. However, every setting will require a different approach and many initiatives in high-burden settings are in development and have yet to be rigorously evaluated. Based on the guidelines on TB screening, the WHO plans to develop a generic operational manual based on the emerging experiences to offer guidance on adaptations and implementation of effective approaches to systematic screening. The essential elements to consider would include:

Situation assessment and preparedness

A baseline assessment that includes an understanding of national and local TB epidemiology, size and distribution of vulnerable population and clinical risk groups and TB programme preparedness is essential before embarking on detailed planning. The analysis should identify gaps and opportunities and assess the potential benefits, risks and costs of screening. Benefits of screening should clearly outweigh the risk of doing

harm, and investments should be reasonable in relation to the needs and expected benefits. In addition, there should be sufficient drugs and capacity to treat the anticipated rise in cases of both drug-susceptible and drug-resistant cases among adults and children.

Setting goals and objective

The goals and specific objectives of screening should be defined according to the identified TB care and prevention gaps. Besides contributing significantly to stopping TB transmission, the main goals of screening are to improve early detection and treatment initiation, thereby reducing the risks of poor treatment outcomes, health sequelae and adverse socioeconomic consequences of TB.[7,16] Different screening approaches and different prioritisation of risk groups and vulnerable population may contribute to these main goals in different ways and to varying extents. Equitable access, implying a preference for the most hard-to-reach groups, should also be considered in the setting of goals and targets.

Identification and prioritisation of risk groups

A few risk groups should always be systematically screened, such as PLHIV, TB contacts and people working in places with high silica exposure, while other risk groups should be prioritised for screening in line with defined objectives and according to national and local TB epidemiology, health systems capacity, availability of resources and feasibility (Table). The situation assessment should therefore identify the most important risk groups, their size, and the barriers and opportunities to reaching them effectively. This requires broader epidemiological data, including that for TB, knowledge and understanding of general health and social services and systems, including existing outreach activities by governmental and non-governmental agencies. Ethical and equity considerations are also critical and will require disproportionately greater efforts and resources to improve access to services for underserved areas and hard-to-reach populations.

Choosing screening and diagnostic algorithms

Choices of screening and diagnostic algorithms (Table) should be made based on the profile of the prioritised risk groups, the TB prevalence in the risk groups, the availability of tests, the capacity of the diagnostic facilities, and the feasibility of using different tests in the context of screening. Screening within health facilities can generally use more advanced technologies. Outreach screening requires special consideration with regard to mobility and field conditions. For example, digital CXR technology offers lower running costs and higher mobility than conventional CXR, but can have high upfront investment costs. Symptom screening may be relatively low-cost, especially in integrated services, but also has low sensitivity. Sputum examination (smear or Xpert MTB/RIF) can become more feasible under outreach conditions if proper sputum collection and transportation is organised.

Ethical considerations

Ethical issues should be considered from the onset of the planning process, preferably with the involvement of end-users in the planning process. Participants should be provided detailed information including benefits and risks, and informed consent should be obtained. Privacy and confidentiality of screening-related information should be ensured. The risk of discrimination and stigmatisation should be carefully assessed before initiating screening. Depending on the risks identified for different target groups, adapted measures should be put in place to minimise such consequences. In particular, the legal status of migrants, with regard to both access to health services and risk of expatriation in case of TB diagnosis, need to be fully considered in designing the screening approach. Similarly, screening among specific occupation groups needs to consider the legal protection of workers' rights to care and right to maintain employment.

Implementation strategies

Many different partners can be involved in TB screening, and it is preferable that TB screening is integrated into other screening and outreach activities to improve both efficiency and relevance for the users. The identification of appropriate entry points for screening is critical; it requires mapping of health providers and social service providers for relevant groups, e.g., endocrinology departments caring for people with diabetes, NGOs providing social support for vulnerable groups, etc. Screening in prisons requires linkages with correctional services, and screening in workplaces requires dialogue with employers and departments of occupational health. The planning and management of required financial and human resources should take into account all possible players that may be involved. Similarly, supply chains for tests and equipment, as well as referral chains, need to be planned with the stakeholders involved. Design, management and financing of sustainable models will require a great deal of relevant information. Implementing TB screening without adequately preparing for the provision of adequate, if not improved, care and support, may adversely affect overall programme performance. Approaches to sustaining performance in the face of increased workload as a result of screening programmes will be context-specific. Given limited human resources, those engaged to help in case finding may offer treatment support as well, especially in serving high-risk groups that may face bigger barriers to staying in care. As an example of service integration, lay workers employed to screen PLHIV can also assist with TB treatment support at the same facilities.[10]

Monitoring and evaluation

A monitoring and evaluation plan should be developed before launching a screening initiative. Indicators and data collection forms and routines need to be adapted to specific screening objectives and local conditions. An appropriate information system needs to be developed to generate data on the number of people diagnosed with TB in relation to the number of people approached and screened, to monitor yield and NNS in each targeted risk groups. General TB epidemiology, the importance of different risk groups, as well as TB epidemiology within each group may change over time, and TB screening prioritisation will have to be adapted accordingly. Targets may be set on the basis of expected yield after assessing the NNS and cost in relation to benefit. General and risk group-specific conditions for discontinuing screening should be established from the outset, e.g., in relation to yield, contribution to overall case detection and improved treatment enrolment and outcomes, and/or cost per case detected.

CONCLUSION

Decades of implementation of passive case finding for TB has brought to the fore its limitations in detecting all persons ill with TB, detecting them early, and making an impact on improving TB outcomes and epidemiology. Systematic screening for active TB has the potential to help address these limitations. Screening for active TB should always supplement and not supplant the provision of prompt diagnosis and treatment for patients presenting to the health services. Broadening the definition of suspected TB among people actively seeking care would be a step towards systematic screening within health facilities. Determination of the correct criteria for requesting a diagnostic test in different epidemiological situations will require further analysis. Furthermore, implementation of systematic TB screening should be informed by proper planning within the TB programme as well as across the health system, prioritisation of risk groups with due regard to equity and ethical considerations, and refinement of approaches through built-in evaluation.

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RÉSUMÉ

La détection des cas de tuberculose (TB) chez les sujets se présentant dans les services de santé avec des symptômes suggestifs de TB, intitulée dépistage passif des cas, est restée l'approche principale de santé publique pour le diagnostic de la TB. Alors que cette approche, combinée avec une amélioration du traitement, avait entrainé des progrès mondiaux substantiels, l'impact épidémiologique global a été inadéquat. La stagnation des cas déclarés et la lente diminution en matière d'incidence poussent à poursuivre une approche plus active de la détection des cas de TB. Le dépistage chez les sujets au contact de la TB et chez les sujets infectés par le virus de l'immunodéficience humaine est recommandé depuis longtemps, mais doit être étendu. Le dépistage dans d'autres groupes à risque pourrait aussi être envisagé en fonction de la situation épidémiologique. L'Organisation Mondiale de la Santé (OMS) a récemment produit des recommandations sur le dépistage systématique de la TB active qui exposent les principes et donnent une orientation sur la prioritisation des groupes à risque pour le dépistage et sur le choix des algorithmes de dépistage et de diagnostic. En vue d'aider à traduire en pratique les recommandations de l'OMS, cet article, qui conclut une série d'Etat de la Question, discute les approches programmatiques. La littérature publiée est peu abondante. Toutefois, il existe une expérience de terrain considérable permettant de tirer d'importantes conclusions. Cet article, en recommandant la prudence à l'égard d'une mise en œuvre hâtive d'un dépistage actif des cas, souligne que la mise en œuvre programmatique du dépistage de la TB exige une approche systématique. Les considérations importantes sont les suivantes : déterminer des buts et objectifs clairs se basant sur une évaluation approfondie de la situation et prenant en compte la place du dépistage de la TB dans une approche globale visant à renforcer la détection de la TB ; l'identification et la prioritisation des groupes à risques ; le choix d'algorithmes appropriés de dépistage et de diagnostic ; et la poursuite de stratégies de mises en œuvre spécifiques au contexte avec l'engagement des partenaires pertinents avec l'attention nécessaire à l'égard des considérations éthiques et un suivi ainsi qu'une évaluation élaborés.

RESUMEN

La detección de casos de tuberculosis (TB) en las personas que acuden a los establecimientos de salud con síntomas indicativos de la enfermedad se denomina búsqueda pasiva de casos y sigue siendo la principal estrategia de salud pública en el diagnóstico de la TB. Aunque con este enfoque, aunado al progreso terapéutico, se han logrado avances considerables, la repercusión epidemiológica general ha sido insuficiente. La estagnación de la notificación de casos y la lentísima disminución de la incidencia motivan la adopción de una estrategia más activa en materia de detección de casos de TB. La detección sistemática de los contactos de pacientes tuberculosos y de las personas infectadas por el virus de la inmunodeficiencia humana se ha recomendado durante muchos años, pero es preciso ampliar su escala de aplicación. Se debe considerar la posibilidad de practicar la detección sistemática en otros grupos de riesgo, en función de la situación epidemiológica. La Organización Mundial de la Salud (OMS) publicó recientemente recomendaciones en materia de detección sistemática de la TB activa que fijan los principios y aportan orientación sobre la priorización de los grupos de riesgo para el cribado, la elección del tipo de detección y los algoritmos diagnósticos. Con el propósito de contribuir a la puesta en práctica de las recomendaciones de la OMS, en el presente artículo, que cierra la serie del Estado de la Cuestión, se analizan los enfoques programáticos. Las publicaciones científicas son muy escasas. Sin embargo, existe un gran acopio de experiencia sobre el terreno de donde extraer enseñanzas importantes. El artículo previene contra una precipitación en materia de búsqueda activa de casos y hace hincapié en que la introducción programática del cribado de la TB exige un enfoque sistemático. Entre los aspectos importantes que precisan consideración se encuentran: establecer metas claras y objetivos definidos con base en una evaluación exhaustiva de la situación, examinar el lugar del cribado de la TB en el enfoque global de refuerzo de la detección de la enfermedad; definir y priorizar los grupos de riesgo; escoger los algoritmos diagnósticos y los métodos de detección apropiados; además de continuar la ejecución de las estrategias con participación de los asociados pertinentes; y prestar la atención debida a los aspectos éticos y los mecanismos integrados de vigilancia y evaluación.