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REVIEW ARTICLE

Missed opportunities for diagnosis and treatment in patients with TB symptoms: a systematic review

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BACKGROUND: The identification of patients with symptoms is the foundation of facility-based TB screening and diagnosis, but underdiagnosis is common. We conducted this systematic review with the hypothesis that underdiagnosis is largely secondary to patient drop out along the diagnostic and care pathway.

METHODS: We searched (up to 22 January 2019) MEDLINE, Embase, and Cinahl for studies investigating patient pathway to TB diagnosis and care at health facilities. We used Quality Assessment of Diagnostic Accuracy Studies 2 (QUADAS-2) to assess risk of bias. We reported proportions of patients with symptoms at each stage of the pathway from symptom screening to treatment initiation.

RESULTS: After screening 3,558 abstracts, we identified 16 eligible studies. None provided data addressing the full cascade of care from clinical presentation to treatment initiation in the same patient population. Symptom screening, the critical entry point for diagnosis of TB, was not done for 33–96% of participants with symptoms in the three studies that reported this outcome. The proportion of attendees with symptoms offered a diagnostic investigation (data available for 15 studies) was very low with a study level median of 38% (IQR 14–44, range 4–84)

CONCLUSIONS: Inefficiencies of the TB symptom screen-based patient pathway are a major contributor to underdiagnosis of TB, reflecting inconsistent implementation of guidelines to ask all patients attending health facilities about respiratory symptoms and to offer diagnostic tests to all patients promptly once TB symptoms are identified. Better screening tools and interventions to improve the efficiency of TB screening and diagnosis pathways in health facilities are urgently needed.

TB caused an estimated 1.5 million deaths in 2020,[1] and remains one of the leading causes of death among adults globally, second only to SARS-CoV-2 as an infectious cause of death in 2020.[2] Unfortunately, the fate of 3 million of the approximately 10 million people who develop active TB annually remains unclear.[1] This large case notification gap is comprised of both patients who are diagnosed but unreported (especially in countries with large private sectors), and people with active but undiagnosed TB. Underdiagnosis is most common in low-income settings, where geographical and financial barriers impede access to care.[1,3-5] These and other delays in the pathway to effective treatment[6] are major contributors to the high case fatality due to TB[7] and to onward TB transmission.[4,5,8]

The diagnosis and care pathway for adult presumptive TB patients starts with presentation to healthcare services, followed by the need for healthcare workers to elicit symptoms, initiate and complete TB diagnostic investigations by interpreting results and communicating to patients before commencing and supporting completion of effective anti-TB treatment.[9] Progress along this pathway can be analysed using a TB "cascade of care" model (Figure 1). Key indicators of cascade progress include percentage of facility attenders in whom TB symptoms are elicited; percentage of TB symptomatic individuals who are offered and complete TB diagnostic testing; percentage of patients with TB disease (identified either by diagnostic test or clinical diagnosis) who initiate TB treatment; and percentage of patients who start treatment, are retained to treatment completion and achieve recurrence-free survival for at least a year.[6,9]

The International Standards for Tuberculosis Care recommend that all patients attending a health facility with unexplained cough of ⩾2 weeks should be investigated for TB.[10] However, symptoms of TB are often missed by healthcare workers,[11] leading to diagnostic and care delays.[12] The scale of missed TB symptoms is poorly defined, but thought to make a considerable contribution to TB underdiagnosis at the global level. International infection control guidelines recommend systematic enquiry for cough in all patients attending acute care services.[13] Since 2013, international TB guidelines have also recommended systematic enquiry of all patients in high TB burden countries for cough duration, and additional TB symptoms according to the national prevalence of TB and HIV, aiming to support early diagnosis.[14]

This systematic review aimed to collate evidence relating to how effectively TB symptoms are recognised and acted upon under routine programmatic conditions in the 48 countries that appear in the three lists of WHO-defined high TB burden countries (HBCs) for general TB, TB-HIV and multidrug-resistant TB (MDR-TB). Specifically, we aimed to investigate proportions of patients who make it to each next stage of the pathway of care from the time they present with TB symptoms through to treatment initiation (Figure 1).

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KEY WORDS

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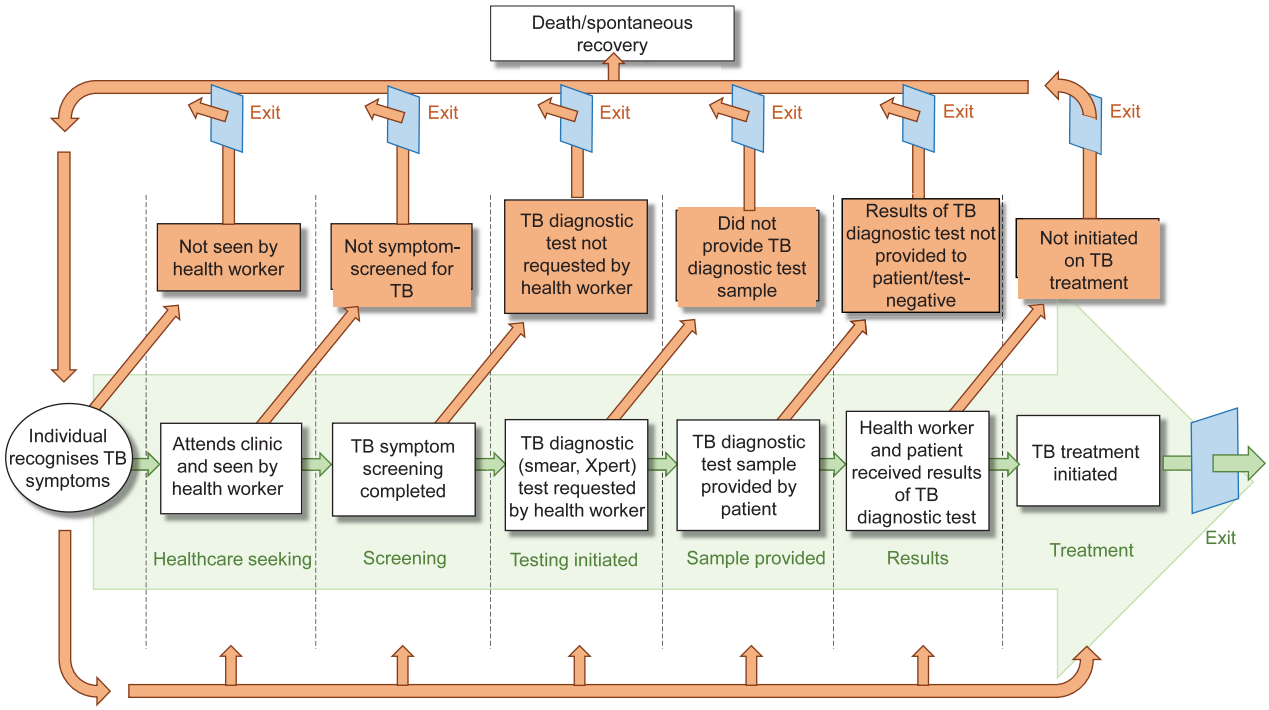

FIGURE 1 The diagnostic and care pathway for TB at health facility level, outlining opportunities for TB diagnosis and treatment in a symptomatic individual.

METHODS

Protocol registration and adherence to international standards

We registered the systematic review protocol with the International Prospective Register of Systematic Reviews (PROSPERO, registration number CRD42018106284). We prepared our study protocol, performed the systematic review and wrote the report following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendations.[15]

Definitions

We aimed to provide summary estimates of the proportion of patients seeking health care at different levels of the health system (community providers, primary healthcare, secondary healthcare and specialist outpatients clinics) who had symptoms consistent with TB; the proportion of those who were offered TB symptom screening; the proportion who were offered and received diagnostic testing for TB (including patient receipt of results); and the proportion found to have microbiologically confirmed TB who were subsequently initiated on anti-tuberculosis treatment.

We defined "TB symptom screening" as any enquiry into symptoms consistent with TB. We defined "investigation for TB" as any screening/diagnostic test for TB defined by primary studies, including (but not limiting to) microbiological (including, but not limited to smear of sputum or other body fluids, culture or Xpert® MTB/RIF [Cepheid, Sunnyvale, CA, USA]) or radiological (including, but not limited to chest X-ray or ultrasound), or referral to another health facility with the intent to diagnose TB. "Investigation" was defined as undergoing a TB test. "Receipt of result" was defined as receiving outcome after undergoing a TB investigation. We defined "initiation of TB therapy" as commencement of any course of therapy with intent-to-treat active TB. We defined "recruitment period" as the time during which a patient with symptoms consistent with TB attended any healthcare setting. For participant follow-up time, we adopted the definitions provided by individual studies.

Eligibility criteria

We included studies published in any language in or after 2000 that recruited adult participants from the WHO's Published List of 30 High TB Burden Countries, who were attending any healthcare setting for any reason with symptoms consistent with TB. To be eligible, a study needed to report data allowing extraction of at least one of the following proportions of the population of interest that enter into any step of the TB cascade of care: offered TB symptom screening; offered TB investigation for TB; received investigation for TB; and initiated TB therapy.

Eligible study designs were cross-sectional studies, standardised patient studies, exit interview studies, and cohort studies (prospective and retrospective). Standardised (simulated) patient were studies that involved a covert member of the research team (the standardised patient) who presented to a healthcare facility or pharmacy and, when questioned by health workers, would give a history of TB symptoms that should prompt further clinical questions, examinations and tests for TB. Exit interview studies were typically done at the point of clinic exit shown in Figure 1, where a sample of patients leaving the health facility were asked about the screening and diagnostic tests received during their clinic visit. We excluded studies that reported on clinical trials, register linkage studies, autopsy studies, prevalence surveys and community-based studies, because participants in these studies would not be representative of patients in routine care. Studies starting with diagnosed TB patients were excluded as being unable to provide unbiased numbers for stages earlier in the TB care cascade.

Information sources and data extraction

We systematically searched for studies meeting our eligibility criteria in Medline (Pubmed), Embase (OVID) and CINAHL (EBSCO Host) using the search strategies shown in Appendix 1. We in-

cluded studies published between 1 January 2000 and 22 January 2019, when we ran the search.

Two reviewers (THD and JL) independently screened titles and abstracts of the articles identified through the electronic searches against the eligibility criteria. THD and JL independently assessed full texts of the included papers, extracted data from eligible studies using a standardised electronic form (Google Forms, Google, United States), and documented reasons for non-inclusion. A third reviewer (PM) resolved disagreements in eligibility.

We extracted the following data from the eligible articles: first author; year of publication; facility and country of data collection; dates of study; level of healthcare facility (primary care, hospital); study definitions of review outcomes (TB symptoms, TB symptom screening, TB investigation); management options available on site (e.g., smear, chest X-ray, Xpert, TB treatment); study design; study eligibility criteria; study population characteristics (HIV status, sex, age); number of patients recruited; number of patients with TB symptoms; number of patients symptom-screened; number of patients with symptoms tested for TB; number of patients with microbiologically confirmed TB; number of patients started on TB treatment; and factors associated with an individual being screened based on quantitative analysis. We excluded studies that did not report information on any of the study outcomes.

Assessment of methodological quality

For a meta-analysis of exit-interview and standardised patient studies, no accepted risk of bias tool exists. We therefore adapted the Quality Assessment of Diagnostic Accuracy Studies 2 (QUADAS-2) tool[16] to our specific question (see Supplementary Data 2) to assess risk of bias at the level of the study across three domains: selecting patient, classifying TB symptoms and diagnosing TB. For each domain, we reported the level of risk or concern as being either high, low or unclear. TD and JL independently performed risk of bias assessment on all studies, and PM resolved discrepancies.

Statistical analysis

For each included study, we reported on the following proportions (and corresponding 95% exact binomial confidence intervals (CIs), either as reported in respective articles or, if not available, as calculated by us: 1) patients attending a healthcare facility for any reason who were offered symptom screening for TB; 2) patients with TB symptoms who were offered further investigation for TB; 3) patients who were offered further investigation for TB who receive results of TB testing; 4) patients who receive results of TB testing who were initiated on TB therapy; and 5) missed TB: the proportion of patients with TB who were not initiated on TB therapy. We performed descriptive analysis producing forest plots of these proportions. Study level median and interquartile range (IQR) were calculated rather than formal meta-analysis because of heterogeneity. All statistical analysis was carried out in R Statistical Software v3.6.0 (R Foundation for Statistical Computing, Vienna, Austria).

Ethics approval

As this work did not involve direct contact with human subjects or participant identifiable data, ethical approval was not required.

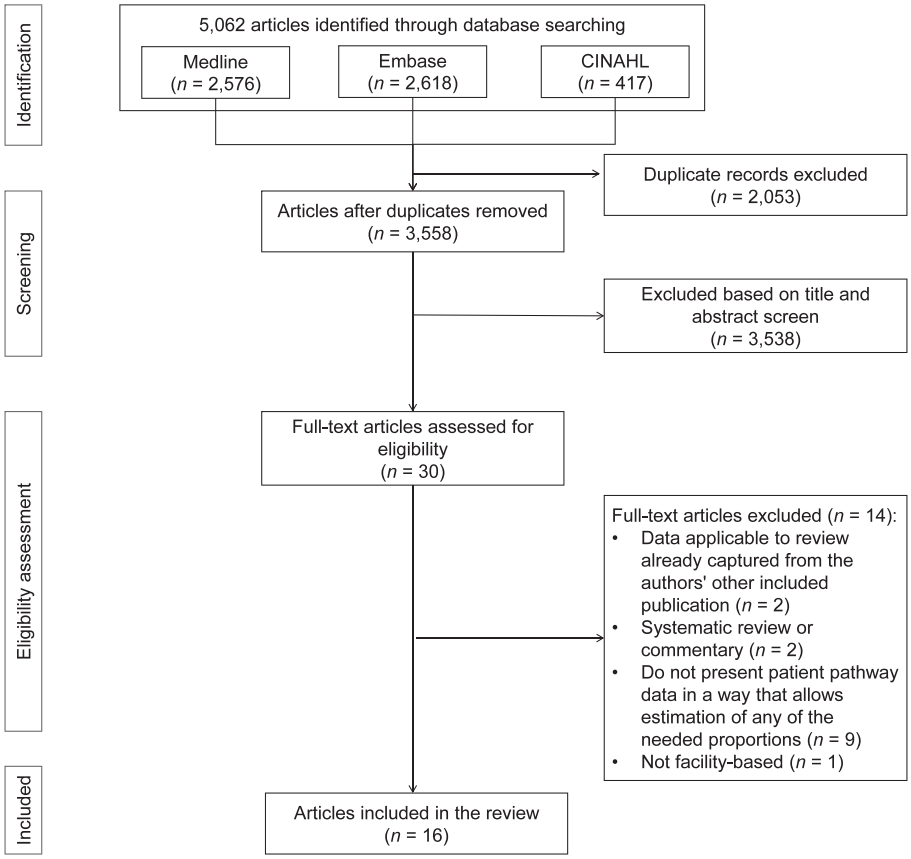

FIGURE 2 Flowchart for the selection of studies on the diagnostic and care pathway for TB in high-burden countries.

TABLE 1 Characteristics of the included studies (n = 16)

Study	Country	Study design	Setting	Participants eligibility	TB symptom definition	TB test available at study site	Individuals with TB symptoms* *n* (%)	Individuals with TB symptoms screened* *n/N* (%)	Individuals offered TB test* *n/N* (%)	Individuals received TB test* *n/N* (%)	Individuals received TB result* *n* (%)
Der, 2021[35]	Ghana	Exit interview	Hospital	⩾18 years exiting heath facility with TB symptom	Cough, fever, night sweats, weight loss	Sputum test	653/1,652 (40%)	386/581 (66%)	31/581 (5%)	31/31 (100%)	Not reported
Feasey, 2021[38]	Malawi	Exit interview	PHC	⩾18 years exiting heath facility	HIV plus cough, night sweats, fever, weight loss or HIV- with weight loss or cough, > 2 weeks	Sputum test	445/2322 (20%)	256/445 (58%)	36/256 (14%)	21/36 (58%)	1/21 (5%)
Amenuvegbe, 2016[40]	Ghana	Cross-sectional	Two rural hospitals	Outpatient presentation during study period with cough of ⩾2 weeks	⩾2 weeks of cough	Smear	Not reported	Not reported	Not reported	230/932 (25%)	Not reported
Chihota, 2015[32]	South Africa	Exit interview	PHC	⩾18 years exiting PHC	Any of cough ⩾24 h or fever of night sweats or weight loss	Xpert	4,098/8,104 (51)	2,130/3,604 (60)	818/2,130 (38)	Not reported	Not reported
Claassens, 2013[11†]	South Africa	Exit interview	PHC	⩾18 years exiting PHC not on TB treatment or collecting TB results	Any cough, productive cough, haemoptysis, fever, night sweats, chest pain or weight loss	Smear and culture	3,564/4,686 (71)	16/423 (4)	4/16 (25)	2/4 (50)	Not reported
Kweza, 2018[34‡]	South Africa	Exit interview	PHC	⩾18 years exiting PHC not on TB treatment	Any duration of cough, loss of weight, fever or night sweats	Xpert	Not reported	622/1,255 (50)	134/622 (22)	61/134 (46)	Not reported
Christian, 2018[33]	South Africa	Standardised patient	PHC	SP, presumptive TB	Cough ⩾2/52	Sputum test and HIV test	143/143 (100)	143/143 (100)	119/143 (83)	Not reported	Not reported
Daniels, 2017[36]	Kenya	Standardised patient	Various	SP, presumptive TB	2–3 weeks of cough and fever	Sputum testing	42/42 (100)	42/42 (100)	21/42 (50)	Not reported	Not reported
Das, 2015[27]	India	Standardised patient	Various	SP, presumptive TB	2–3 weeks of cough and fever	Sputum test, CXR or referral	150/150 (100)	Not reported	22/150 (15)	Not reported	Not reported
Kwan, 2018[28]	India	Standardised patient	Various	SP, presumptive TB	2–3 weeks of cough and fever	Sputum test, CXR or referral	1,762/1,762 (100)	1,762/1,762 (100)	807/1762 (46)	Not reported	Not reported
Miller, 2017[29]	India	Standardised patient	Pharmacies	SP, presumptive TB	3–4 weeks of cough and fever	Refer	333/333 (100)	333/333 (100)	150/333 (45)	Not reported	Not reported
Rojpibulstit, 2007[37]	Thailand	Standardised patient	Pharmacies	SP, presumptive TB	1 month of cough and fever	Refer	70/70 (100)	70/70 (100)	3/70 (4)	Not reported	Not reported
Satyanarayana, 2016[30]	India	Standardised patient	Pharmacies	SP, presumptive TB	2–3 weeks of cough and fever	Refer	599/599 (100)	599/599 (100)	96/599 (16)	Not reported	Not reported
Sylvia, 2017[18]	China	Standardised patient	Various (hospital, health centre)	SP, presumptive TB	2–3 weeks of cough and fever	Sputum test, CXR or refer	274/274 (100)	274/274 (100)	112/274 (41)	Not reported	Not reported
Vu, 2012[39]	Vietnam	Standardised patient	Pharmacies	SP, presumptive TB	4 weeks of cough and fever	Refer	138/138 (100)	138/138 (100)	59/138 (43)	Not reported	Not reported
Singh, 2014[31]	India	Cross-sectional	Hospital	Cough >2 weeks or HIV-positive and cough any duration	Cough ⩾2 weeks or HIV-positive and cough of any duration	Smear or CXR or "serological test"	242/242 (100)	Not reported	93/242 (39)	Not reported	Not reported

*Outcome definitions: TB symptoms (as reported in studies); TB symptoms screen (any enquiry into symptoms consistent with TB); TB test (any screening/diagnostic test for TB or referral to another health facility for the same); receiving TB test (undergoing a TB investigation); receiving TB result (receiving outcome after undergoing a TB investigation).
†Classens 2013: collected spot sputum from 423 TB symptomatic participants individuals exiting a health facility regardless of reason for presentation or clinic management. Of the 406, 21 (5%) with available smear and/or culture result were positive. None of the 21 presented because of their respiratory symptoms, none had TB symptoms screen and none were offered TB test during their visit.
‡Kweza 2018: collected spot sputum from 779 TB symptomatic participants missed by clinic staff and performed Xpert and 39 (5%) tested positive.
PHC = primary health care; SP = simulated patient study; CXR = chest X-ray.

RESULTS

Selection of studies

We identified 5,611 articles from the electronic searches, which decreased to 3,558 after removing duplicates (Figure 2) using EndNote X7, and to 30 after title and abstract screening against the study eligibility criteria. After full-text review against eligibility criteria, 16 articles remained and were included in the systematic review. We excluded 14 articles: 2 because the data applicable to the review was already included in the authors' other included

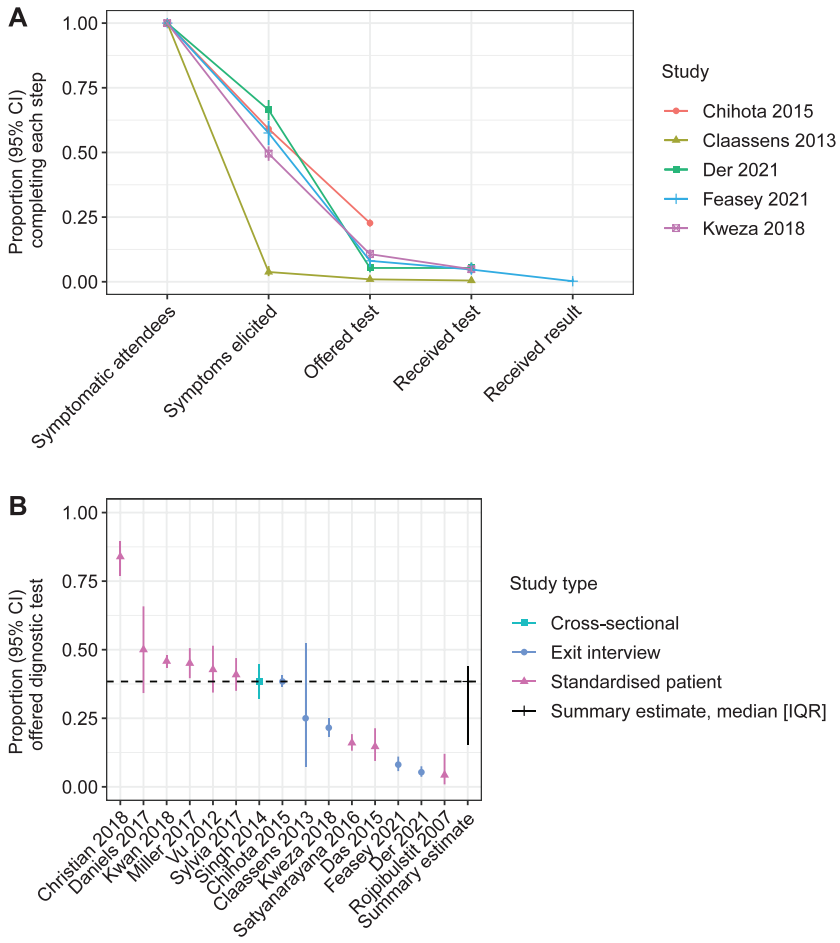

FIGURE 3 **A)** TB diagnostic and care cascade for exit interview studies showing proportion of symptomatic attendees in whom symptoms were elicited, who were offered a diagnostic test and who received test results, and **B)** proportion of symptomatic attendees who were offered a diagnostic test after being asked about symptoms in all included studies. In all cases, exact binomial confidence intervals are shown. CI = confidence interval.

publication,[17,18] 2 because data were not original to research manuscripts (1 commentary and 1 systematic review),[9,19] 9 studies because they did not report data that could be mapped to our pre-defined patient categories and 1 because it was a community-based study.[20–26]

Description of studies

The 16 eligible studies were published between 2000 and 2021 and reported data from India,[27–31] South Africa,[11,32–34] Ghana,[35] Kenya,[37] Malawi,[38] Thailand,[39] China,[18] Vietnam[11,32,34] and Ghana[40] (Table 1). Nine studies employed the standardised patient design, five were exit interview studies, and the remaining two were cross-sectional studies. All studies included adults only; most studies defined TB symptoms as "having chronic cough"; and available TB tests included smear microscopy, chest X-ray or referral to the next level of care. All five exit interview studies were from primary healthcare settings in South Africa,[31] Malawi[38] and Ghana.[35] The two cross-sectional studies were a rural hospital study from Ghana;[40] and a hospital-based study from India.[33] Four of the seven standardised patient studies were conducted in pharmacies in India,[36] Thailand,[27,28] and Vietnam;[39] 1 was in a South African primary health care setting;[33] 1 involved facilities at various levels of care in Kenya;[36] and another 2 involved various levels of the Indian healthcare system.[27,28]

TB diagnostic and care pathway

None of the included studies provided data addressing the full cascade of care from clinical presentation to treatment initiation in the same patient population. Exit interview studies reported proportion of participants systematically screened for symptoms, while the remainder of the studies mostly reported the proportion that were offered or received a diagnostic investigation.

The proportions of participants who reported having been screened for TB symptoms in the five exit interview studies ranged from 4% to 66% (Figure 3A). The proportion of symptomatic attendees offered a diagnostic investigation (data available for 16 studies), was highly variable, ranging from 0.04 to 0.84 (median 0.38, IQR 0.14–0.44; Figure 3B). To note, 9/16 studies were standardised patient studies[27–30,33,36,37,39,41] in which, despite reporting classical TB symptoms to attending care givers, up to 96% of the participants were not offered a TB diagnostic investigation (Table 1). The five studies that assessed receipt of TB investigation reported the following proportions: 50% (2/4),[11] 46% (61/134),[34] 24% (230/932),[40] 100% (31/31)[35] and 58% (21/36).[38] One study

TABLE 2 Assessment of the included studies for risk of bias using the QUADAS-2 tool

	Risk of bias in each of the assessed domains		
Author, year	Patient selection	Classification of TB symptoms	Diagnosing TB
Der, 2021	Low	Low	Low
Feasey, 2021	Low	Low	Low
Amenuvegbe, 2016	High	High	High
Chihota, 2015	Low	Low	Low
Claassens, 2013	Low	Low	Low
Kweza, 2018	Unclear	Low	High
Christian, 2018	Low	Unclear	Not applicable*
Daniels, 2017	Low	Low	Not applicable*
Das, 2015	Low	Low	Not applicable*
Kwan, 2018	Low	Low	Not applicable*
Miller, 2017	Low	Low	Not applicable*
Rojpibulstit, 2007	Low	Low	Not applicable*
Satyanarayana, 2016	Low	Low	Not applicable*
Sylvia, 2017	Low	Low	Not applicable*
Singh, 2014	Low	High	High
Vu, 2012	Low	Low	Not applicable*

* Risk of bias in the "diagnosing TB" domain for studies that involved standardised patients was reported as not applicable
QUADAS = Quality Assessment of Diagnostic Accuracy Studies.

that collected sputum at point of exit from 779 individuals not tested by clinic staff, detected 39 cases (5%).[34] Of the 39, 24 were symptom-screened by clinic staff, but not offered a TB test.

Assessment of risk of bias

We evaluated the identified studies using the pre-adapted QUADAS-2 tool for the assessment of risk of bias, and found that all included studies conducted their patient selection and classification of TB symptoms according to the expectation of the systematic review question. In the five studies that involved diagnosing TB, one exhibited a high risk of bias because not all patients utilised the same diagnostic strategy (Table 2).[31]

DISCUSSION

The main finding of this systematic review was that in 16 studies across high TB burden countries, a study-level median of only 38% of patients with TB symptoms were offered a TB test. TB symptom screening, the critical entry point for diagnosis of TB, was reportedly not done for 34–96% of symptomatic participants in the five studies that reported this outcome. There was substantial heterogeneity between studies largely driven by between-setting variations in implementation approach and level of adherence to TB screening protocols. Nevertheless, this review suggests that a failure to identify TB symptoms in those seeking healthcare and a failure to test those who present with TB symptoms may be a key driver of missed TB diagnosis in high TB settings. If so, this should be amenable to interventions that not only aim to reduce the TB diagnosis and treatment gap, but also highlight existing gaps for screening and diagnostic tools that can be employed at the point of care.

Our results are consistent with long-standing concerns about the quality of TB care provided at primary care level facilities, with high levels of missed identification of symptoms and sub-optimal management once symptoms are identified, and contributing to inefficiency in the TB diagnostic pathway.[42] Optimising facility-based management of self-presenting patients with TB symptoms should be a priority for national TB programmes because it addresses the targeting of the "missing millions" in infection control, and complements community-based active case-finding.[8] Failure to promptly identify patients with symptoms will also reduce the likely patient and public health impact of new TB diagnostics, because most of the target population would simply not be offered the testing they should receive.

Better management of symptomatic self-presenting primary care-level patients is an urgent priority that all countries should be focused on. However, we also recognise the limitations of a symptom-based approach. The inherent subjectivity of symptom screening leads to variations in the way questions are asked or responded to,[43] and different responses to the same question when asked at different times or by different individuals.[43] In population-level TB prevalence surveys, the sensitivity of cough of at least 2 weeks' duration for active TB disease is only 35% (95% CI 24–46) compared to microbiological reference standards.[44] This highlights the need for screening tools that are more accurate, less subjective and easier to monitor than symptom screening, while ideally remaining accessible and low-cost.

A key principle of TB screening is that it must be directed towards populations with a higher prevalence of disease where individual benefits are likely to outweigh risks, and delivered with patient convenience as a key priority.[45] Among populations attending health centres, alternatives to symptom-based approaches for facility-based TB screening include TB triage tests such as digital chest radiography and computer-aided diagnosis or point-of care host biomarker testing performed prior to confirmatory testing. Triage tests aim to rule out TB, allowing health workers to prioritise patients with a higher prior probability of TB for more expensive, slower confirmatory tests such as Xpert or culture testing.

Individual and public health consequences of inefficiencies in establishing a diagnosis and providing prompt and effective treatment of TB include premature death, as patients with undiagnosed TB have a high mortality rate, especially if also living with HIV,[7] and more severe post-TB lung disease and other permanent sequelae of TB. Increasingly severe illness tends to prompt multiple healthcare visits, with patients incurring pre-diagnosis "catastrophic costs" and repeated courses of non-specific treatments, including broad-spectrum antibiotics until their TB is finally diagnosed.[42,47,48] Cost savings from timely diagnosis of TB averting visits, from both health-system and patient perspectives, need to be factored into economic decision-making when TB diagnostic investments are considered. Public health consequences of delayed diagnosis include onward transmission, including nosocomial transmission while attending health facilities for diagnosis, with patients potentially becoming more infectious as the severity of their underlying TB and symptoms progress.[49–51] Early diagnosis and treatment therefore are key tools if national TB programmes are to arrest transmission.

The key programmatic implication of our findings is that frontline health workers in the TB diagnostic pathway are either unaware of expectations of national programmes or are unable to adhere to current TB case-finding guidelines. Results from two included studies carried out in India[27,28] suggest that TB diagnosis can be improved in that setting by having better qualified personnel at the entry point of the diagnostic pathway. On the other hand, Silvia et al. found that management at a higher level facility (hospital) was more likely to include TB diagnosis than health centre or village clinic management.[41] Finally, Singh et al., who compared management of patients with symptoms in public and private facilities, found that public facilities performed better.[31]

There are three likely underlying issues that need to be addressed. First is the general weakness of the health system, which can be amenable to investments in health sector strengthening programmes (particularly in universal health coverage) and in public private partnerships.[52] Second is the lack of good screening tools beyond symptom screening which – if faithfully adhered to – would overburden the already limited capacity for confirmatory testing. Third is the very lack of simple, quick and low-cost confirmatory diagnostic testing with the ability to provide same-day, same-clinic results.

Our review has several limitations. The first limitation is the paucity of data; only 14 studies were identified with relevant data, and the number of participants per study also limited our analytical scope. Second, our focus on a single clinical episode may have limited our ability to fully interrogate the TB diagnostic pathway, which often includes multiple clinical encounters. Third, our case definitions for TB investigation which included referral for TB assessment, as well as more sensitive diagnostics such as Xpert testing in one category, may have limited specificity. Fourth, we were unable to report disaggregate data for various forms of TB because the included studies did not distinguish between screening algorithms recommended for different patient subgroups.

CONCLUSIONS

In conclusion, this study demonstrates that the substantial gaps within the TB diagnosis and care pathway are likely making substantial contributions to the so-called "missing millions" of TB cases. Failure to complete TB symptom screening and offering TB tests to all those screening positive is a critical breakpoint in this cascade at which patients with TB may be missed. Acknowledging the limitations of symptom screening and the need for better tools, there is urgent need to identify and implement interventions and approaches that strengthen health systems can recognise local TB epidemiology and improve the quality of clinical encounters in favour of TB recognition, diagnosis and treatment.

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CONTEXTE : L'identification des patients symptomatiques est à la base du dépistage et du diagnostic de la TB en centres de soins, mais les sous-diagnostics sont fréquents. Nous avons réalisé cette revue systématique en émettant l'hypothèse que le sous-diagnostic était bien moins important que la perte de vue des patients tout au long du parcours diagnostique et thérapeutique.
MÉTHODES : Nous avons interrogé les bases de données MEDLINE, Embase et Cinahl (jusqu'au 22 janvier 2019) pour identifier les études ayant évalué le parcours diagnostique et thérapeutique des patients atteints de TB en centres de soins. Nous avons utilisé le QUADAS-2 (Quality Assessment of Diagnostic Accuracy Studies 2) afin d'évaluer le risque de biais. Nous avons rapporté les proportions de patients présentant des symptômes à chaque stade du parcours, du dépistage symptomatique à l'instauration du traitement.
RÉSULTATS : Après avoir passé en revue 3 558 résumés, nous avons identifié 16 études éligibles. Aucune ne fournissait, dans une même population de patients, de données sur l'ensemble de la cascade de soins, de la présentation clinique à l'instauration du traitement. Le dépistage symptomatique (point de départ essentiel du diagnostic de la TB) n'avait pas été réalisé pour 33–96% des participants symptomatiques dans les trois études ayant rapporté ce résultat. La proportion de personnes symptomatiques consultant à qui un examen diagnostique a été proposé (données disponibles pour 15 études) était très faible, avec une médiane de 38% (IQR 14–44 ; écart 4–84).
CONCLUSIONS : Le manque d'efficacité du parcours patient fondé sur le dépistage symptomatique de la TB est un facteur contributif majeur du sous-diagnostic de la maladie. Cette inefficacité reflète une mise en œuvre incohérente des recommandations qui stipulent de demander à tous les patients consultant en centres de soins s'ils présentent des symptômes respiratoires et de proposer rapidement des tests diagnostiques à tous les patients une fois les symptômes de TB identifiés. De meilleurs outils et interventions de dépistage permettant d'améliorer l'efficacité du parcours de dépistage et de diagnostic de la TB en centres de soins sont urgemment nécessaires.

Public Health Action (PHA) welcomes the submission of articles on all aspects of operational research, including quality improvements, cost-benefit analysis, ethics, equity, access to services and capacity building, with a focus on relevant areas of public health (e.g. infection control, nutrition, TB, HIV, vaccines, smoking, COVID-19, microbial resistance, outbreaks etc).