

Socio-economic drivers of Drug-Resistant Tuberculosis in Africa: A Scoping Review

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Abstract

Background

Drug-resistant TB (DR-TB) remains a public health concern due to the high morbidity and mortality rates from the disease. The DR-TB is a multifaceted illness with expensive treatment regimens, toxic medications and most often the long duration of treatment constitutes a substantial financial burden on both infected patients and the health system. Despite significant research advances so far in the diagnosis and treatment, there is a paucity of synthesized evidence on how socio-economic factors are associated with DR-TB. This review aims to address this gap by synthesizing available evidence and data on the main socio-economic drivers of DR-TB infection in Africa.

Methods

We conducted a systematic search on PUBMED and Google Scholar databases from January 2011 to March 2020 using Joanna Briggs Institute's scoping review approach. Our eligibility criteria only included systematic reviews and studies conducted with quantitative research methods (cross-sectional, case-control, cohort and randomized-control trials) in this review. We also considered studies conducted in Africa and focused on socio-economic factors influencing DR-TB burden in African countries. Data was extracted from all the studies that met the eligibility criteria based on the study's objectives.

Results

Out of the 154 articles that were retrieved for review, 20 abstracts of these articles met all the eligibility criteria and were fully reviewed. Of the 20 articles, one was a mixed-method study, 16 quantitative and 3 reviews. The following themes were identified as major findings: Social and economic drivers associated with DR-TB. Substance abuse of which, stigma and discrimination were the prominent social drivers. Economic drivers included poverty, financial constraints because of job loss, loss of productive time during hospital admission and treatment costs.

Conclusion

Our findings provide insights on the socio-economic drivers of DR-TB burden. This is relevant to assist DR-TB management program and TB stakeholders in different settings to address identified socio-economic gaps and to reduce its negative impact on the programmatic management of DR TB. Therefore, redirecting strategies with more focus on socio-economic empowerment of DR-TB patients could be one of the innovative solutions to reduce the spread and eliminate DR-TB in Africa.

Background

Tuberculosis (TB) is a global public health concern and one of the leading causes of morbidity and mortality worldwide [1–3]. Drug-resistant TB (DR-TB) has evolved due to a high TB defaulter rate, leading to complications with TB diagnosis and case management especially in low- and middle-income countries [4–6]. As described in the World Health Organization (WHO) global TB report for 2019, roughly 500 000 persons (range 417 000– 556 000) developed or acquired rifampicin-resistant TB (RR-TB) and of these, 78% had multidrug-resistant TB (MDR-TB). Of all newly reported TB cases globally, a projected 3.4% had RR-/ MDR-TB while among previously treated patients, 18% had RR-/MDR-TB [7]. Further, there is an increase in DR-TB case notification worldwide as indicated in the total number of 186 772 cases of MDR/RR-TB detected and notified in 2018 when compared to the 160 684 notified DR TB cases in 2017. Similarly, increased number of DR-TB cases (156 071 in 2018 compared to 139 114 in 2017) commenced treatment. Even with this increased number placed on treatment, treatment success globally remains low, at 56% [7].

The precise burden of DR-TB in the African countries is poorly described; with only 51% of countries having done official reviews [8]. Thus, DR-TB is commonly missed in Africa and this looms prospects to attain the year 2035 targets of the End TB strategy [9]. This can lead to difficulty in estimating the accurate degree of the problem in the African Region. Available data reveals that between 36 000 and 44 000 MDR-TB cases were reported in the AFRO Region in 2016 and of these, 15% of new MDR-TB patients were found to have RR [3]. South Africa is one of the high MDR-TB burden countries with multiple factors reported to influence the increased incidence and poor outcomes of MDR-TB [3]. In 2018, 227 999 new and relapsed TB cases were notified in South Africa: 13 199 RR/ MDR-TB and 553 Extensively Drug Resistance TB (XDR-TB) laboratory-confirmed cases were reported [7].

Empirical evidence indicates that DR-TB is a multifaceted illness with expensive treatment regimens, toxic medications and long duration of treatment creating a substantial financial burden on the health system [10, 11]. Consequently, socio-economic status, job loss, overpopulation, poor hygiene, immunocompromising illnesses and malnourishment have been identified as risk factors that influence this disease burden hence it is commonly referred to as the disease of the poor [12]. Other facilitators of the disease burden influencing the disease management and outcomes include treatment inaccessibility and distance to the healthcare facility, transport expenses and costs experienced during hospitalization [9, 13–15]. Though significant research developments have been made in the diagnosis and treatment aspects of DR-TB [16], research focused on socio-economic factors associated with DR-TB are limited.

Scoping review research question

Since DR-TB is a huge public health problem as discussed, this review set out to answer these questions:

1. What social factors contribute to the burden of DR- TB in an African Setting?
2. What economic factors influence the burden of DR-TB among infected patients in the African setting?

Scoping review objective

The objective of this review was to synthesize the main socio-economic drivers contributing to the burden of DR- TB in Africa.

Methods

This scoping review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for scoping review [17] and framework by Joanna Briggs Institute [18]. There is no published or registered protocol for this scoping review because it forms part of an on-going Master of Public Health Project.

Search strategy

PubMed and Google Scholar databases were searched to retrieve articles published between the year 2011 and 2020. The following search terms and keywords were used; socio-economic factors, drug-resistance TB, multidrug-resistant tuberculosis, extremely/extensively drug-resistant TB, Africa, social factors, economic factors, contributing factors, and risk factors. From the databases, retrieved articles during the search were first sorted by relevance and year of publication, then, only the first 10 pages were considered. Microsoft Excel was used to manage and organize the data retrieved from the search process.

Eligibility criteria

The following inclusion and exclusion criteria below were applied to identify eligible articles that were reviewed.

Inclusion criteria

Review and quantitative articles were included if they evaluated socio-economic factors influencing adult DR- TB patient from African Countries. Studies that are in English or full articles translated to the English- language were added to the final list.

Exclusion criteria

Qualitative studies were excluded. Studies on drug-sensitive TB were excluded. Epidemiological and clinical studies of MDR-TB and XDR-TB were also excluded. Studies including children under 12 years and participants in prison settings were also excluded.

Selection Process

We adopted a selection process described by the Joanna Briggs Institute online manual. Two reviewers independently searched for articles using the eligibility criteria. Articles retrieved were exported into MS Excel sheet by both reviewers and assessed for duplication and eligibility. There were no discrepancies in articles selected and screened for inclusion in this review.

Data extraction and analysis

Data extraction of eligible articles was carried by one of the reviewers based on intended outcomes to be evaluated and then rechecked by the second reviewer separately for quality purposes. Data was thematically extracted from eligible articles and organized based on the objectives, methodology used, key findings, and implications. Themes that emerged will be discussed in the findings and discussion section.

Results

Search Outcome

From the 154 articles retrieved, 91 were from Google Scholar and 63 from PubMed. Out of these, 42 duplications were identified and removed. The 112 remaining articles were screened for appropriateness. Seventeen articles were removed based on qualitative nature. The 95 remaining articles (19 reviews and 76 quantitative studies) were further assessed for eligibility. Of the 95 remaining articles, only 20 were found eligible and further assessed. A total number of 75 articles were further excluded (59 quantitative articles excluded: 4 children < 5years; 23 not Africa; 18 general/ Drug-Sensitive TB (DS-TB); 11 other factors- clinical; 1 isoniazid-resistant (INH) resistance; 2 XDR with unrelated content and 16 reviews excluded: 5 general- DS-TB; 4 other factors-clinical; 3 not applicable; 1 epidemiological study; 3 not systematic reviews). Figure 1 below presents a schema for the search process and the outcome of the article selection process.

Study setting of reviewed articles

Among the 20 eligible articles selected for review, eight studies (8) were conducted in Ethiopia, five (5) in South Africa and then respectively one (1) in each of the following countries; Cameroon, Angola, Nigeria, Ghana and Angola. The three systematic reviews featured more than one nation all including Sub Sahara African countries.

Summary of the studies reviewed

Table 1 presents that summary of all 20 eligible articles that were reviewed. Of these selected studies, sixteen (16) were quantitative, one (1) was a mixed-method study and three (3) were systematic reviews. Of the 16 quantitative articles, 4 were case controls, 4 cohort studies, 8 cross-sectional. These studies broadly focused on socio-economic risk factors, social issues and financial issues.

Table 1
Summary of the main socio-economic and other factors associated with DR-TB in Africa.

First Author/ Reference	Year	Place	Method	Population	Objective	Findings	Implications	Main associated socio-economic and other factors of MDR
Workicho et al. [19]	2017	Ethiopia	Quantitative: Case-Control	180	Detecting the risk-factors for MDR-TB in patients who already have TB.	The following were strong forecasters for MDR-TB: <ul style="list-style-type: none"> • Age • Previous treatment history • Living in a one-roomed house 	MDR-TB strategies should focus on patients with: <ul style="list-style-type: none"> • Young age • Infected with HIV • Previous treatment history • Crowded living environments. 	Young age Previous TB HIV infected Crowded living areas
Gandhi et al. [20]	2012	South Africa	Quantitative: Case-Control	123 MDR/ 139 XDR	Identifying the risk factors related to death in MDR- and XDR-TB patients with HIV co-infection in South Africa.	Mortality in these patients was related to a larger level of immunosuppression and drug resistance.	Efforts to lessen the death rate should focus on: <ul style="list-style-type: none"> • Strengthening TB management programs • Aggressive HIV testing and treatment initiation. 	Immuno-compromised
Mulisa et al. [21]	2015	Ethiopia	Quantitative: Case-Control	439	Determining risk factors for obtaining MDR-TB.	Predictors of MDR: <ul style="list-style-type: none"> • Farmworker • TB contact • Alcohol • HIV infection • Previous TB / TB-treatment 	In this region, the recognizing of high-risk patients and the diagnosis and treatment of MDR-TB should be a priority.	TB Contact Farmworkers Previous TB Alcohol HIV Infection
Mekonnen et al. [22]	2015	Ethiopia	Quantitative: Cross-sectional	124	The objective is to determine the risk factors for MDR-TB and to estimate prevalence in this area.	Past anti-TB treatment usage was the only statistically noteworthy risk element for MDR-TB.	DOTS program and to optimizing diagnostic laboratory facilities should be improved.	Previous TB
Roba et al. [23]	2018	Ethiopia	Mixed: Case-control	100 MDR/ 300 DS-TB	This analysis aimed to evaluate the quality of life of MDR-TB patients in comparison (DS-TB) patients.	MDR-TB patients were more probable to have the following in comparison with DS-TB: <ul style="list-style-type: none"> • Single • Current student • Low education level • Households with more than 5 persons <p>All of these were associated with poorer quality of life ($p < 0.05$).</p>	Suggested that healthcare facilities, media and all community participants be involved in the TB education of the community, homes and students.	Single Student Lower educational level Crowded families > 5

First Author/ Reference	Year	Place	Method	Population	Objective	Findings	Implications	Main associated socio-economic and other factors of MDR
Van den Hof et al. [24]	2016	Ethiopia/ Kazakhstan/ Indonesia	Quantitative: Cross-sectional	603	Measuring MDR-TB patients' costs using a current TB patient cost measurement tool.	The economic burden of MDR-TB is distressing. When the patient is the breadwinner the extra costs and loss of income impact worse on these families.	Relieving the cost of these patients should be a government priority.	Financial loss- unable to work Job loss No health insurance/ assistance Loans
Ramma et al. [25]	2015	South Africa	Quantitative: Cross-sectional	134	To approximation patient expenditures related to the diagnosis and treatment of RR-TB/MDR-TB in South Africa.	The average monthly patient costs accompanying the diagnosis and treatment of RR-TB and MDR-TB were greater during the intensive phase than the continuance phase (US\$235 vs. US\$188) and amongst in-patients than outpatients (US\$269 vs. US\$122). Most patients did not make use of social support for costs associated with the illness.	Suitable social support mechanisms should be offered to assist in managing these constraints.	Production time loss through hospitalization Dietary enhancements requiring extra money High out of pocket cost throughout the continuation phase No social protection
Du Toit et al. [26]	2015	South Africa	Quantitative: Cohort	360	An assessment of costs incurred by patients in LPA vs GeneXpert-centered diagnostic algorithms from symptom onset until treatment start for MDR-TB.	The average number of visits to initiation of MDR-TB treatment was reduced from 20 to 7 ($P < 0.001$) and average costs fell from US\$68.1 to US\$38.3 ($P = 0.004$) in the Xpert group. The total of unemployed rose from 39–73% in the LPA group ($P < 0.001$) and from 53–89% in the Xpert group ($P < 0.001$). Average domestic income reduced by 16% in the LPA group and by 13% in the Xpert group.	The use of an Xpert-based process reduced the costs experienced by patients, but employment loss and income continue. Patients necessitate support to alleviate this impact.	Loss of employment and income
Xavier et al. [27]	2015	Angola	Quantitative: Cross-sectional	81	The aim was to identify the levels of depression, anxiety, and emotional hardship in patients with TB. the secondary aim to establish the relationship between social-demographic and economic factors, clinical factors and anxiety, depression and emotional hardship.	38.3% and 49.4% of the sample produced significant levels of anxiety and depression, res. 44.4% of patients had substantial degrees of emotional distress. Higher risks of anxiety reported in married patients. MDR-TB, diagnosis of extra-pulmonary TB. Female gender and cases of extra-pulmonary TB had a 1.5 times risk for emotional distress.	The study identified high rates of depression, anxiety, and emotional hardship amongst TB patients. Gender, Marital status, type and treatment of TB were related to greater emotional disorder levels. Mental health services should be an essential part of TB and MDR-TB care	Anxiety Depression Emotional distress Marital and family problems/ separation

First Author/ Reference	Year	Place	Method	Population	Objective	Findings	Implications	Main associated socio-economic and other factors of MDR
Mulu et al. [28]	2015	Ethiopia	Quantitative: Case-Control	306	To determine the risk factors of MDR-TB patients in this setting.	<p>Patients with TB treatment failure (AOR = 13.5, CI = 2.69-70), cavitations on chest x-ray (AOR = 1.9, CI = 1.1-3.38) and contact with MDR-TB patients (AOR = 1.4, CI = 0.19-0.39) were more probable to be MDR-TB patients. Other factors were:</p> <ul style="list-style-type: none"> • Low monthly salary (AOR = 1.1, CI = 0.34-0.47) • Alcohol intake (AOR = 1.5, CI = 0.2-0.98) • Young age (AOR = 2.9, CI = 1.07-7.68) 	<p>Strict devotion to directly observed therapy (DOTS), suitable management of TB patients and guidance on the nutrition are helpful to regulate the dissemination of MDR-TB.</p>	<p>Clinical factors: cavitations Previous TB failure</p> <p>MDR-TB contact</p> <p>Low monthly income</p> <p>Alcohol usage</p> <p>Young age</p>
Kendall et al. [29]	2013	South Africa	Quantitative: Cohort	225	Identify patient risk factors for defaulting from MDR-TB treatment and high-risk periods.	<p>Defaulting was the main reason for patients not finishing treatment and those not cured. Other risks:</p> <ul style="list-style-type: none"> • Younger age • Financially-unstable patients • Alcohol and drug users 	<p>Outpatient care should be targeted to increase efforts to improve success rates.</p>	<p>Young age</p> <p>Economically unstable</p> <p>Alcohol and drug usage</p>
Merikki et al. [30]	2013	Cameroon	Quantitative: Cross-sectional	1706	To studied anti-TB drug resistance reports, the influence of socioeconomic and as behavioural factors on the prevalence of TB and drug resistance.	<p>Associated factors for TB:</p> <ul style="list-style-type: none"> Smoking Alcohol consumption Antiretroviral treatment for ≤ 12 months Household TB contacts Only prior tuberculosis infection was linked with drug resistance. 	<p>Abstinence from smoking and alcohol should be incorporated in TB and HIV regulate programs by health authorities.</p>	<p>Smoking</p> <p>Alcohol</p> <p>ARVs < 12 months</p> <p>Previous TB contact</p> <p>Previous TB</p>

First Author/ Reference	Year	Place	Method	Population	Objective	Findings	Implications	Main associated socio-economic and other factors of MDR
Molie et al. [31]	2019	Ethiopia	Quantitative: Cohort	751	The aim was to determine the outcome during the intensive phase and factors contributing to MDR-TB in Ethiopia.	<p>Negative intensive phase treatment outcome was further present in:</p> <ol style="list-style-type: none"> 1. Higher age [ARRR = 1.047, 95% CI (1.024, 1.072)] 2. History of hypokalemia [ARRR = 0.512, 95% CI (0.280, 0.939)]. <p>Having an unknown intensive phase treatment outcome:</p> <ol style="list-style-type: none"> 1. Managed under the ambulatory care [ARRR = 3.2, 95% CI (1.6, 6.2)], 2. Rural inhabitants [ARRR = 0.370, 95% CI (0.199, 0.66)] 3. No treatment supporter [ARRR = 0.022, 95% CI (0.002, 0.231)] 	<p>To better favourable treatment outcome stress should be given to:</p> <ol style="list-style-type: none"> 1. Doing scheduled laboratory monitoring tests 2. Treatment adherence support 3. Recording and report 4. Quarterly cohort review 5. Elderly and rural patients 	<p>Older age</p> <p>Rural residents</p>
Oladimeji et al. [32]		Nigeria	Quantitative: Cross-sectional)	98	Assessing the psychosocial wellbeing of MDR-TB patients in voluntary and remote long-term hospitalization in Nigeria.	<p>Females had more psychosocial anxieties. The most common fears were:</p> <ol style="list-style-type: none"> 1. Concern that people will get to know the patient infected bad type of TB (70%), 2. Dissatisfaction due to being separated from their marital partner (72%), 3. Anxieties about taking too many drugs (73%), 4. Irritation with not being able to continue social and economic activities (75%). <p>Those who were employed had more psychosocial concerns. Patients who had family support during hospitalization experienced a lower burden of psychosocial concerns.</p>	<p>Lengthy hospitalization stemmed in significant psychosocial burden for the MDR-TB patients. There is a need to consider alternative approaches with less psychosocial burden without compromising the quality of care.</p>	<p>Marital problems/ separation</p> <p>Inability to continue socio-economic activities</p> <p>Stigma</p>

First Author/ Reference	Year	Place	Method	Population	Objective	Findings	Implications	Main associated socio-economic and other factors of MDR
Alene et al. [33]	2017	Ethiopia	Quantitative: Cross-sectional	264	Spatial analysis of MDR-TB, and its association with socio-economic, domestic factors and demographic in northwest Ethiopia.	Spatial crowding of MDR-TB was positively associated with: 1. Urbanization (RR: 1.02; 95%CI: 1.01, 1.04) 2. The percentage of men (RR: 1.58; 95% CI: 1.26, 1.99)	Cross-border projects including options for portable TB treatment units and follow up are vital for the successful control of MDR-TB in the region.	Spatial clustering Periodic migration work
Moyo et al. [34]	2015	South Africa	Quantitative: Cohort study involving a retrospective analysis of data	452	Investigating the loss from treatment (LFT), and post-treatment outcomes of DR-TB patients in this setting	LFT existed great, occurred throughout the therapy period and was mainly high in males and those aged 15–25 years. Overall, long-term survival was poor.	Further investigations are required to back the retention of DR-TB patients on treatment, even within community-based treatment programs.	Males Young Community-based care
Pedrazzoli et al. [35]	2018	Ghana	Quantitative: Survey	691 (66 MDR)	Examining, by MDR class, the level and alignment of costs incurred by TB-affected families; assessed the affordability of TB care; and describes surviving tactics used by TB-affected homes.	Appalling costs affected 64.1% of patients. MDR more than DS patients. Payments for TB care led to a noteworthy increase of families in the study sample that live below the poverty threshold at the time of survey compared to pre-TB diagnosis.	Innovative policies are urgently needed to certify TB care is affordable for TB patients.	High costs during treatment Poverty
Di Gennaro et al. [36]	2017	Multiple countries including African countries	Review	407,555	A review was directed at examining the affiliation of common social determinants on therapy failure and MDR in people with TB.	Therapy failure and MDR are linked to: 1. Low income 2. Low educational 3. Alcohol abuse	Further studies should focus on the effect of these social determinants on other evolving diseases and of other social determinants on TB prevention and treatment. should be implemented to prevent tuberculosis.	Low income Low educational level Alcohol abuse
Lukoye et al. [37]	2015	Sub Saharan Africa	Systemic review	13,465 new and 1,776 previously treated TB	To evaluate the disparities in DR-TB and its determinants across SSA nations (new and formerly treated TB).	Pooled approximation of any DR-TB prevalence with the new cases was 12.6% (95% CI 10.6–15.0) while for MDR-TB this was 1.5% (95% CI 1.0–2.3). Among formerly treated patients, these were 27.2% (95% CI 21.4–33.8) and 10.3% (95% CI 5.8–17.4%), respectively.	Low prevalence of DR-TB in sub-Saharan Africa in comparison to the WHO estimates. MDR-TB in this region does not seem to be driven by the high HIV prevalence rates	Low DR-TB rates
Thomas et al. [38]	2016	2 Rural Sub Saharan African (others: Peru/ India/ Nepal/ East Kazakhstan/ Mexico/ Uganda)	Systemic review	282	Identify psychosocial factors influencing MDR-TB.	Issues reported causing psychosocial anxieties: Depression, stigma, discrimination, and financial limits due to MDR-TB.	a critical need exists for feasible, psychosocial and economic intervention studies that help to equip MDR-TB patients to cope with their illness, improve outcomes and quality of life of an MDR-TB patient	Depression Stigma and discrimination Psychological distress Financial constraints

Emerg ed themes from studies reviewed

1. Social issues influencing MDR-TB

Thirteen studies looked at the social issues influencing MDR-TB. This included apprehensions on stigma and prejudice, the impact of ethanol on the management of MDR-TB, low educational level, overcrowding, lack of treatment support and problems related to MDR-TB/HIV coinfection.

1.1 Substance use and abuse: Five articles on treatment outcomes among the eligible studies found that alcohol consumption influenced MDR-TB. Alcohol consumption was found to be a predictor of MDR-TB poor treatment outcomes [21], while substance use was observed to cause poor adherence to treatment [38]. Hence, substance use and abuse were identified as risk factors for MDR-TB acquisition or development and conversely, alcohol consumption was associated with treatment default and failure rate among new DR-TB cases [28].

1.2 Poverty: The highest rates of DS-TB and DR-TB were discovered in the disadvantaged settings of the community such as the rural areas, overcrowded households and congested areas [19, 23, 33]. Low-income people and persons with little educational exposure had an increased risk of infection [36, 38]. Poverty may result in poor nutrition, which may be related, with alterations in the immune system, causing an increased vulnerability. Poverty, on the other hand, results in congestion, poor ventilation and unhygienic environments, increasing the risk of TB transmission [38].

1.3 Stigma and Discrimination: Thomas et al. (2016) highlight stigma and discrimination as the drivers for the infection and transmission of MDR-TB [38]. Stigma and discrimination in MDR-TB burdened setting was shown to also negatively affect a patient's health-seeking behavior and access to healthcare. Stigma and discrimination included rejection from family, friends or health workers, financial uncertainty and feelings of anxiety and depression [27]. It was found that MDR-TB patients would willingly isolate themselves for fear of infecting other members of the family. This can often result in isolation, cancellation of engagements, failed relationships and separation within the family [38].

2. Economic Factors influencing MDR-TB

MDR-TB has a vast financial effect on patients due to the complex nature and long duration and of treatment regimens. Socio-economic barriers affecting patient care included treatment distance, inaccessibility, transport costs and costs experienced during hospitalization [35]. There was also associated job losses and production time loss during the initial intensive phase of treatment [24, 25]. Thomas et al. (2016) found that patients who had not returned to work after one year of being on medication were their family's breadwinners which had to cease working for a substantial amount of time [38]. Decrease in income due to absenteeism from work and the treatment-related loss of income and extra costs was generally catastrophic [24].

Quality of Evidence

More than a third of the articles were done in the same setting, Ethiopia. Thus, participants in these studies could have overlapped. There were no randomized control trials in this review. There might be a need to conduct randomized control trials on socio-economic intervention strategies.

Discussion

This review was specifically focused on the African Region as this area has a high rate of DR-TB with limited resources to combat the disease burden. So, it is of utmost importance to identify these factors to stimulate the development of interventions to improve DR-TB treatment outcomes and decrease the incidence rate of DR-TB.

The social factors identified in these articles include apprehensions around stigma and prejudice, the impact of alcohol on the management of DR-TB, low educational level, overcrowding, and lack of treatment support. The social causes of TB are attributed to the mode of spread of TB, as well as the risk factors for acquiring the disease. This review highlights the social factors influencing DR-TB specifically emphasizing overcrowding as a major contributing factor. Eradicating extreme poverty and providing social protection could significantly reduce DR-TB. DR-TB patients would willingly isolate themselves for fear of scattering infection to other members of the family and due to discrimination and stigma. This can often lead to separation, cancellation of engagements, failure of relationships and separation within the family [38]. In places like Africa where TB and HIV are still regarded as a "killer disease", TB clients could suffer detrimental effects of being isolated, negatively affecting their treatment adherence status, thus, and creating a risk for increased morbidity and mortality. Substance use is frequently observed among patients with poor adherence and has an impact on MDR-TB management. Substance abuse is also associated with high poverty and unemployment levels. In the population with an increased drug and alcohol utilization, it is empirical to study the impact of this increase's substance abuse on MDR-TB and to identify intervention strategies to curb the problem.

The articles also identified economic factors influencing DR-TB. Numerous factors were identified to cause financial constraints- job loss, loss of productive time, absenteeism and regular reviews all due to the long duration of care and admission time. Breadwinners who are admitted cause significant emotional distress in families- these are also reasons for defaulting and absconding, to avoid admission- to be able to provide for the family. There are also treatment-related costs- getting to review date has associated transport cost. Series effort needs to be made to address and develop strategies to decrease the financial burden.

There is, however, little evidence to notify policymakers and control officers on how socioeconomic interferences should be used to improve MDR-TB control and reduce MDR-TB-related health disparities. There needs to be an immense scale-up of collaborative efforts toward the implementation of integrated model care, considering the health systems, socio-economic factors as well as medical factors.

Limitations

Although a thorough literature search was conducted, only a small amount of eligible articles were found. This limited number of articles could be because only two databases were used to retrieve information. The authors used these databases because they were open-access databases that required no institutional payments before they could be searched for eligible articles. Lastly, this scoping review focused on socio-economic factors that influence DR TB in African regions however, these factors could differ in other continents.

Conclusion

In conclusion, this review has highlighted the influence of socio-economic factors on DR- TB incidence and outcomes. Furthermore, it is crucial to understand these socio-economic factors driving DR-TB in a context-specific setting, to come up with evidence-based intervention strategies that would curb the burden of drug-resistant TB. To achieve the End TB strategy targets, it is imperative to harness both medical and socio-economic efforts to fights against DR-TB disease. DR-TB elimination would require a holistic, comprehensive approach, utilization of available strategies, and associated medical, socio and economic challenges. The management of DR tuberculosis will require concerted efforts that address the socio-economic factors as well. To strengthen the findings from this review and the body of evidence, larger-scale randomized control trials to test socio-economic interventions should be undertaken.

Abbreviations

DS-TB - Drug-Sensitive TB

DR-TB - Drug-Resistance TB

LFT - Lost From Treatment

MDR-TB – Multi-Drug Resistance TB

XDR-TB- Extensively Drug Resistance TB

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

All data generated and analyzed for the review are available upon request from the authors.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

LLC and KEO conceptualized and performed the scoping review, LLC wrote the manuscript using synthesized data, KEO provided guidance to LLC, KEO and DTG revised the manuscript. All three authors approved the final version of the manuscript

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Figures

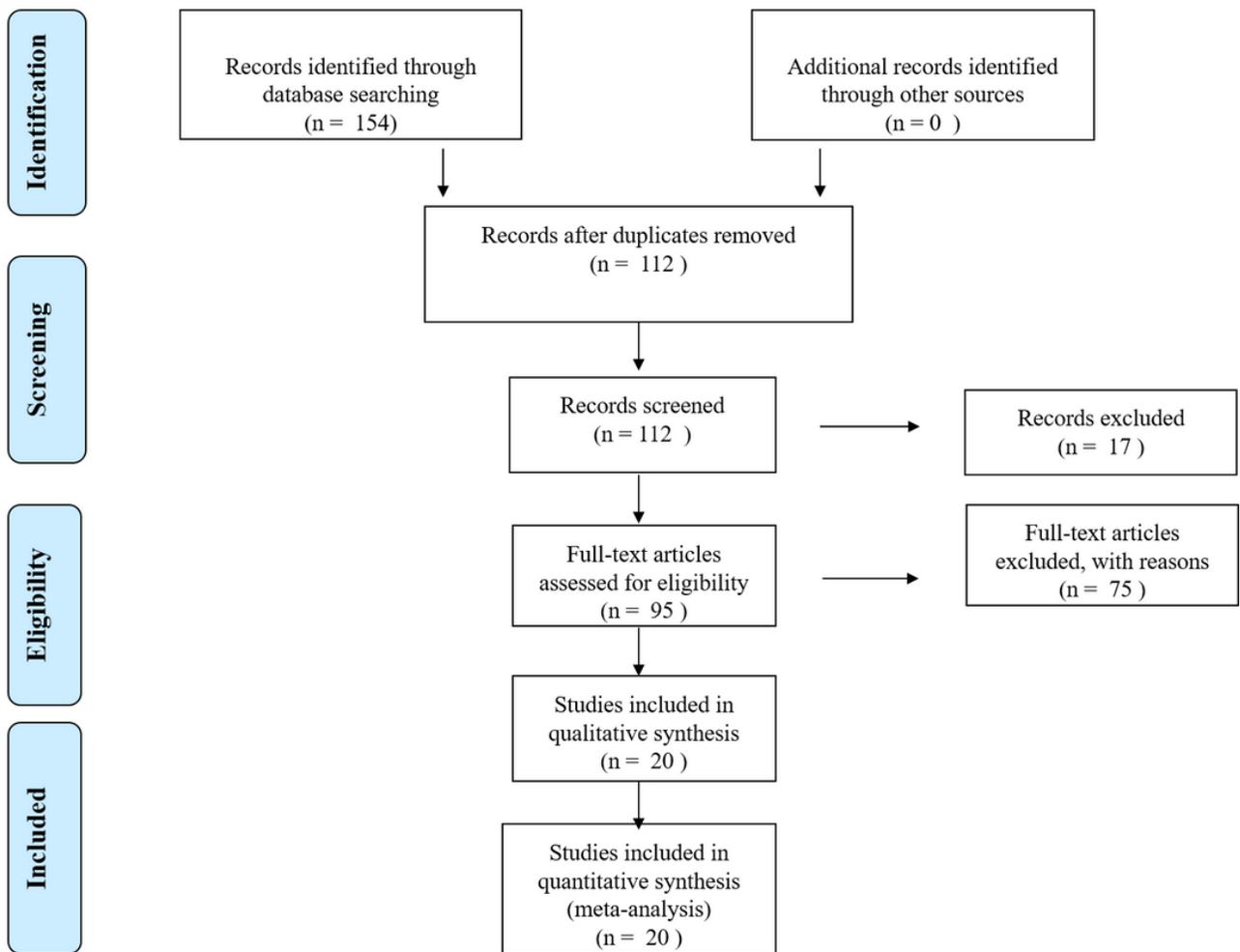


Figure 1

PRISMA flow diagram illustrating the search process which eligible articles were identified for data synthesis.

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