TB case finding, contact tracing, linkage to care and preventive therapy (Isoniazid)

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Description of condition and intervention

Tuberculosis (TB) is caused by Mycobacterium tuberculosis, affects most commonly the lungs. The medium of transmission for TB is mainly through droplet route like when people with lung TB cough, sneeze, or spit. Global estimates indicate that about 10 million people every year fall ill with tuberculosis (TB) and about 1.5 million people die from TB annually. Thus, TB is by far the most infectious disease impacting mortality. Further, TB is the leading co-morbidity in people with HIV.

The key strategy to fighting TB involves diagnosis of TB and provision of treatment to those with the disease. Preventive strategies include vaccination, infection control, and chemoprophylaxis or isoniazid preventive therapy. Prevention of TB in HIV positive individuals and those at high-risk including household contacts involves screening, and instituting isoniazid preventive therapy to reduce the risk of TB. Source: (WHO 2021, DCP3). This evidence brief assesses effects and costs for three particular interventions that are being analysed in FairChocies: DCP Analytics tool (for an overview of other TB interventions, see appendix below and there are separate evidence briefs for these):

TB-01 Active TB case finding in HIV+ individuals and other high-risk groups, linkage to care

TB-02 TB contact tracing, linkage to care

TB-03 TB preventive therapy (Isoniazid) for high-risk people (e.g., PLHIV) HIV population screening and early treatment

International guidelines

Organization	Indications/recommendations	Applicability in LIC & Lower MIC settings
World Health Organization	WHO consolidated guidelines on tuberculosis: module 1: prevention: tuberculosis preventive treatment WHO consolidated guidelines on tuberculosis Module 2: Screening – Systematic screening for tuberculosis disease WHO consolidated guidelines on tuberculosis Module 3: Diagnosis - Rapid diagnostics for tuberculosis detection	Yes

Intervention attributes

Type of interventions & Delivery platform

Table 1: Type of interventions & delivery platform

Intervention	Type	Delivery platform
1. Active TB case finding in HIV+ individuals and other high-risk groups, linkage to care	Diagnostic	Community
2. TB contact tracing, linkage to care	Diagnostic	Community
3. TB preventive therapy (Isoniazid) for high-risk people (e.g., PLHIV) HIV population screening and early treatment	Preventive	Health centre

Equity

In addition to considerations like cost-effectiveness and health systems factors, dimensions of equity can be relevant for priority setting. The opportunity for a long and healthy life varies according to the severity of a health condition that individuals might have, so there are inequities in individuals' opportunities for long and healthy lives based on the health conditions they face. Metrics used to estimate the severity of illness at an individual level can be used to help prioritize those with less opportunity for lifetime health. FairChoices: DCP Analytics Tool uses Health adjusted age of death (HAAD), which is a metric that estimates the number of years lived from birth to death, discounting years lived with disability. A high HAAD

thus represents a disease less severe in terms of lifetime health loss, while a low HAAD represents a disease that is severe on average, causing early death or a long period of severe disability. It is also possible to estimate the distribution of HAAD across individuals with a health condition. FairChoices shows for each intervention an average HAAD value of the conditions that are affected by respective interventions that have health effects. Additionally, a plot shows HAAD values for around 290 conditions (Johansson KA et al 2020).

Time dependence

Low level of urgency. Treatment outcomes not highly affected by some days of delay.

Population in need of interventions

Table 2: Population in need of interventions

Intervention	**Treated population**		**Affected population**		**Disease state addressed**
	Treated age	Treated fraction	Affected age	Affected fraction	
1. Active TB case finding in HIV+ individuals and other high-risk groups, linkage to care	0 to 99 years both genders; incidence based	1	No effects		HIV/AIDS-Drug-susceptible Tuberculosis
2. TB contact tracing, linkage to care	0 to 99 years both genders; incidence based	1	No effects		Drug-susceptible tuberculosis
3. TB preventive therapy (Isoniazid) for high-risk people (e.g., PLHIV) HIV population screening and early treatment	0 to 99 years both genders; incidence based	1	0 to 99 years of those with the condition	1	HIV/AIDS-Drug-susceptible Tuberculosis

Intervention effect and safety

Table 3: Effect and safety of interventions for Tuberculosis

Effect of intervention		Certainty of evidence
Incidence TB preventive therapy (Isoniazid) for high-risk people (e.g., PLHIV) HIV population screening and early treatment	TB preventive therapy (any anti-TB drug) versus placebo was associated with a lower incidence of active TB (RR 0.68, 0.54-0.85). This benefit was more pronounced in individuals with a positive tuberculin skin test (RR 0.38, 0.25-0.57) than in those who had a negative test (RR 0.89,0.64-1.24) (Akolo 2010).	Meta-analysis (See appendix)

Model assumptions

Table 4: Summary of model parameters and values used in FairChoices – DCP Analytical Tool

Category	Model parameter	Notes
Interventions	1. Active TB case finding in HIV+ individuals and other high-risk groups, linkage to care 2. TB contact tracing, linkage to care 3. TB preventive therapy (Isoniazid) for high-risk people (e.g., PLHIV) HIV population screening and early treatment	
Cost parameters		
Treated population and fraction	See Table 2	Epidemiological data from Global Burden of Disease Study 2019
Effect parameters		
Affected population and fraction	See Table 2	
Comparison	No intervention	
Incidence reduction (RRR) TB preventive therapy (Isoniazid) for high-risk people (e.g., PLHIV) HIV population screening and early treatment	0.62	Akolo 2010

Intervention cost

The cost of routine contact tracing to identify individuals exposed to TB and link them to care is estimated to be 6.6 USD per incident case in 2011 in Malaysia (Atif, Sulaiman, Shafie, Ali, Asif 2012).

The cost of systematic identification of individuals with TB symptoms among high-risk groups and linkage to care ("active case finding") is estimated to be 448.47 USD per incident case in 2012 in Cambodia (Yadav, Nishikiori, Satha ,Eang, Lubell 2014).

The cost for screening for latent TB infection following a new diagnosis of HIV, followed by yearly screening among PLHIV at high risk of TB exposure; initiation of isoniazid preventive therapy among all individuals who screen positive but do not have evidence of active TB is estimated to be 98.4 USD per unit in 2010 in Brazil (Azadi et al 2014).

References

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Appendix

Literature Review for effectiveness & safety

This literature search is an example of Level 1 search for intervention inputs taken from DCP3 or generated in an ad hoc manner (e.g., quick google search found one study of cervical cancer screening cost-effectiveness that was used to create an effectiveness parameter for that intervention).

Level of evidence of efficacy studies:

1. low (expert opinions, case series, reports, low-quality case control studies)
2. moderate (high quality case control studies, low quality cohort studies)
3. high (high quality cohort studies, individual RCTs)
4. very high (multiple RCTs, metaanalysis, systematic review, clinical practice guidelines)

An overview of all TB interventions in FairChoices: DCP Analytics Tool, interventions assessed in this evidence brief are marked in bold.

Active TB case finding in HIV+ individuals and other high-risk groups, linkage to care
TB contact tracing, linkage to care
TB preventive therapy (Isoniazide) for high-risk people (e.g., PLHIV)
Drug-susceptible TB management
Pulmonary TB
Pulmonary TB, no HIV
Core diagnostics
First-line treatment
Pulmonary TB, HIV
Core diagnostics
First-line treatment
Extrapulmonary TB
Extrapulmonary TB, no HIV
Core diagnostics
First-line treatment
Extrapulmonary TB, HIV
Core diagnostics
First-line treatment
Drug-resistant TB management
Multidrug-resistant (MDR) TB
MDR TB, no HIV
Core diagnostics
First-line treatment
MDR TB, HIV
Core diagnostics
First-line treatment
Extensively drug-resistant (XDR) TB
XDR TB, no HIV
Core diagnostics
First-line treatment
XDR TB, HIV
Core diagnostics
First-line treatment
Surgery for management of MDR/ XDR-TB treatment failure