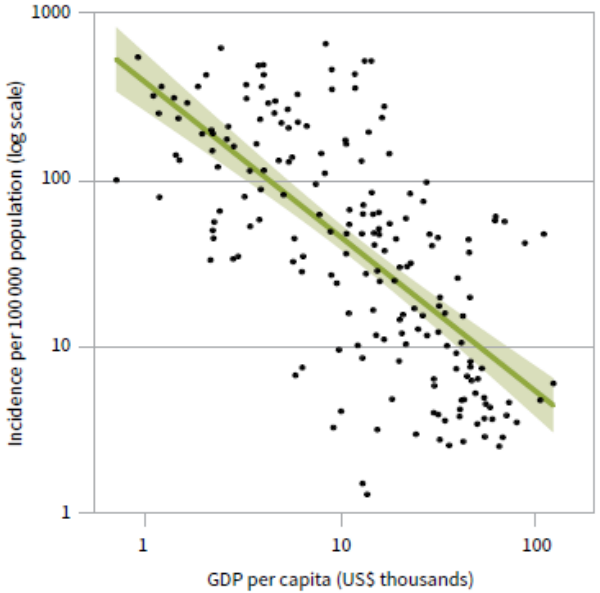
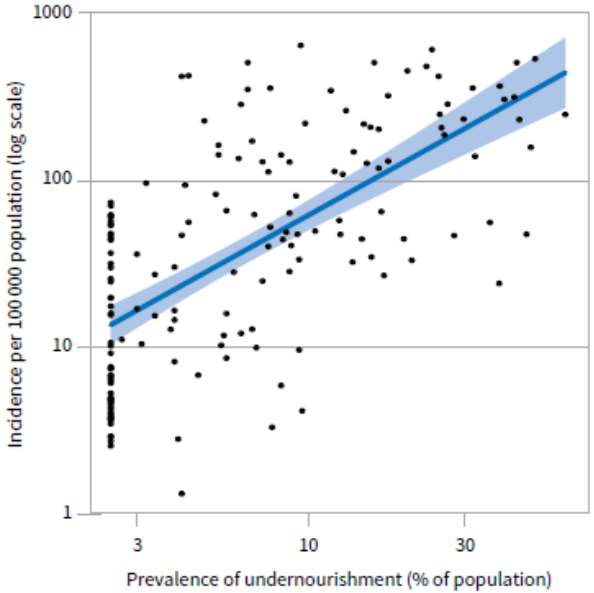
Why social protection is essential to end TB

Dr Delia Boccia (WHO Consultant)

The social determinants of TB: poverty and undernutrition





* The year of data used for GDP per capita and undernourishment is the latest year for which data are available in the World Bank (https://data.worldbank.org/) and SDG (https://unstats.un.org/sdgs/dataportal) databases, respectively.

Poverty

Undernutrition

- TB is strongly influenced by **social and economic development**
- Fastest declines in TB incidence and mortality in western Europe occurred in the 1950s and 1960s, **with expanding UHC, rapid socioeconomic development**, and availability of effective treatments.
- There is a clear **relationship between TB incidence and (i) undernourishment and (ii) GDP per capita**

The social determinants of TB: living and working conditions

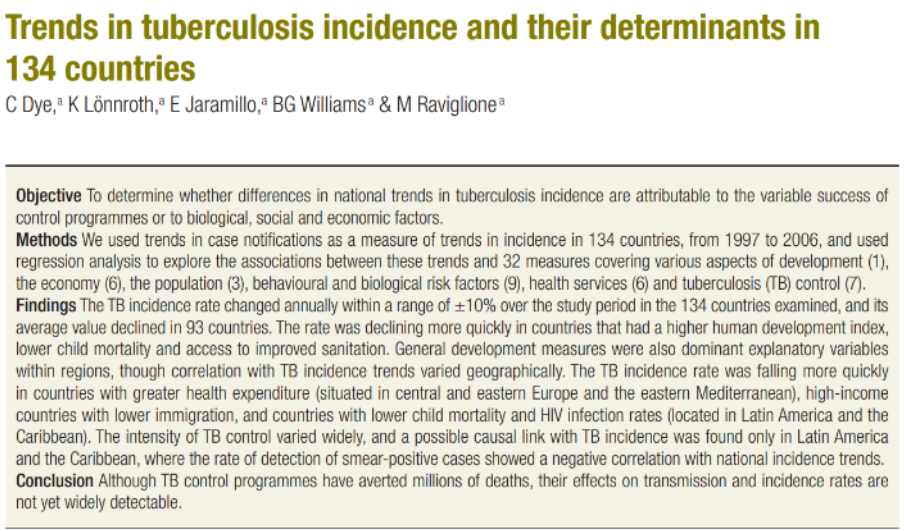
Housing

Imprisonment

Working condition

Crowding – Indoor and outdoor pollution - low income – social exclusion - violence

Determinants of TB incidence decline



Trends in tuberculosis incidence and their determinants in 134 countries

C Dye,[a] K Lönnroth,[a] E Jaramillo,[a] BG Williams[a] & M Raviglione[a]

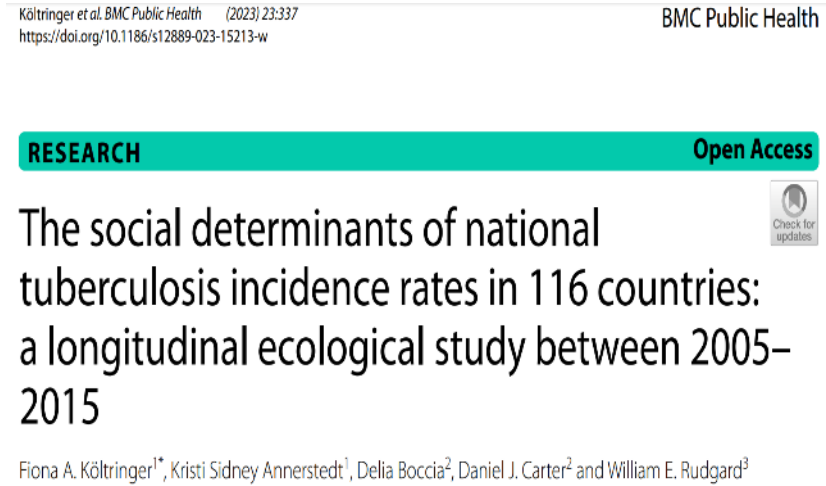
Objective To determine whether differences in national trends in tuberculosis incidence are attributable to the variable success of control programmes or to biological, social and economic factors.

Methods We used trends in case notifications as a measure of trends in incidence in 134 countries, from 1997 to 2006, and used regression analysis to explore the associations between these trends and 32 measures covering various aspects of development (1), the economy (6), the population (3), behavioural and biological risk factors (9), health services (6) and tuberculosis (TB) control (7).

Findings The TB incidence rate changed annually within a range of ±10% over the study period in the 134 countries examined, and its average value declined in 93 countries. The rate was declining more quickly in countries that had a higher human development index, lower child mortality and access to improved sanitation. General development measures were also dominant explanatory variables within regions, though correlation with TB incidence trends varied geographically. The TB incidence rate was falling more quickly in countries with greater health expenditure (situated in central and eastern Europe and the eastern Mediterranean), high-income countries with lower immigration, and countries with lower child mortality and HIV infection rates (located in Latin America and the Caribbean). The intensity of TB control varied widely, and a possible causal link with TB incidence was found only in Latin America and the Caribbean, where the rate of detection of smear-positive cases showed a negative correlation with national incidence trends.

Conclusion Although TB control programmes have averted millions of deaths, their effects on transmission and incidence rates are not yet widely detectable.

Dye C, Lönnroth K, Jaramillo E, Williams BG, Raviglione M. Trends in tuberculosis incidence and their determinants in 134 countries. Bull World Health Organ. 2009 Sep;87(9):683-91.



Költringer *et al. BMC Public Health* (2023) 23:337
https://doi.org/10.1186/s12889-023-15213-w

BMC Public Health

RESEARCH

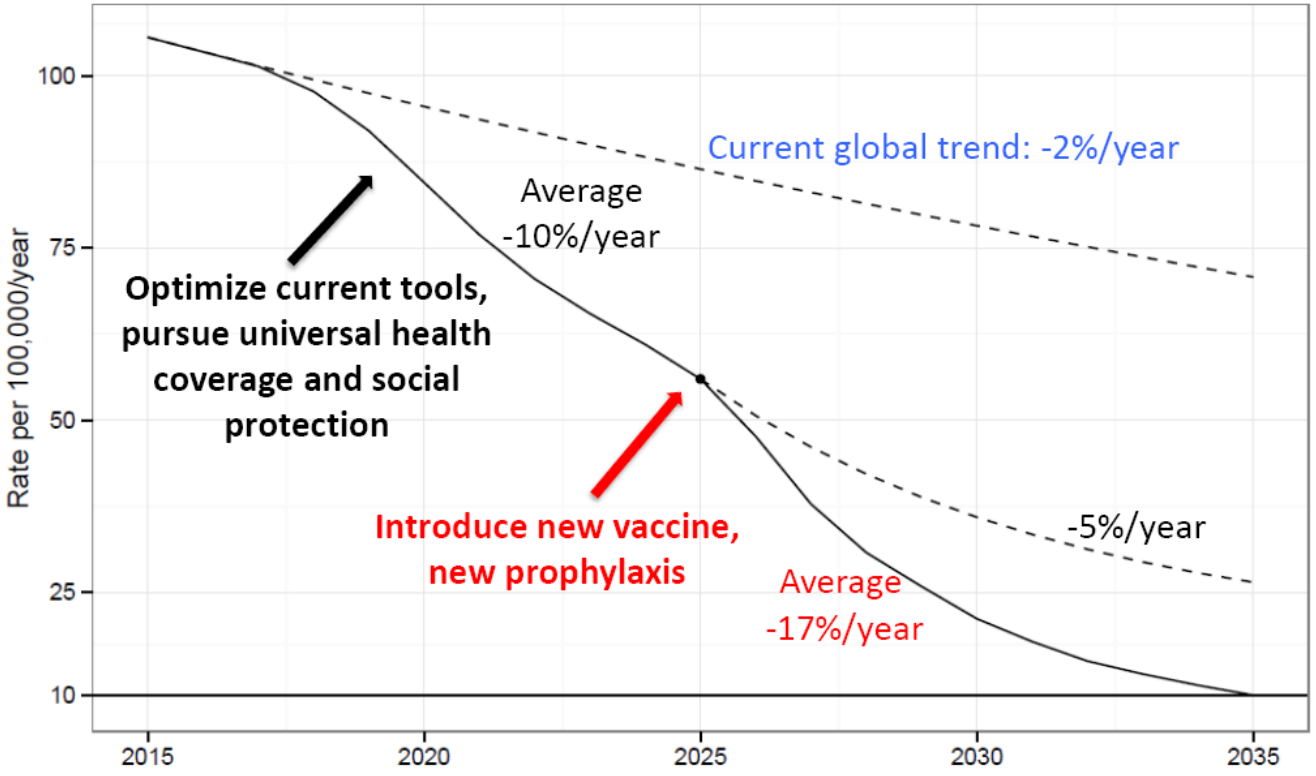
Open Access

The social determinants of national tuberculosis incidence rates in 116 countries: a longitudinal ecological study between 2005–2015

Fiona A. Költringer[1*], Kristi Sidney Annerstedt[1], Delia Boccia[2], Daniel J. Carter[2] and William E. Rudgard[3]

Költringer FA, Annerstedt KS, Boccia D, Carter DJ, Rudgard WE. The social determinants of national tuberculosis incidence rates in 116 countries: a longitudinal ecological study between 2005-2015. BMC Public Health. 2023 Feb 15;23(1):337.

Projected acceleration of TB incidence decline to target levels



What is social protection?

- Social protection, or social security, is a human right and is defined as the set of policies and programmes designed to reduce and prevent poverty and vulnerability throughout the life cycle.

- Social protection includes benefits for children and families, maternity, unemployment, employment injury, sickness, old age, disability, survivors, as well as health protection.

- Social protection systems address all these policy areas by a mix of contributory schemes (social insurance), non-contributory tax-financed benefits (social assistance), and legislation.

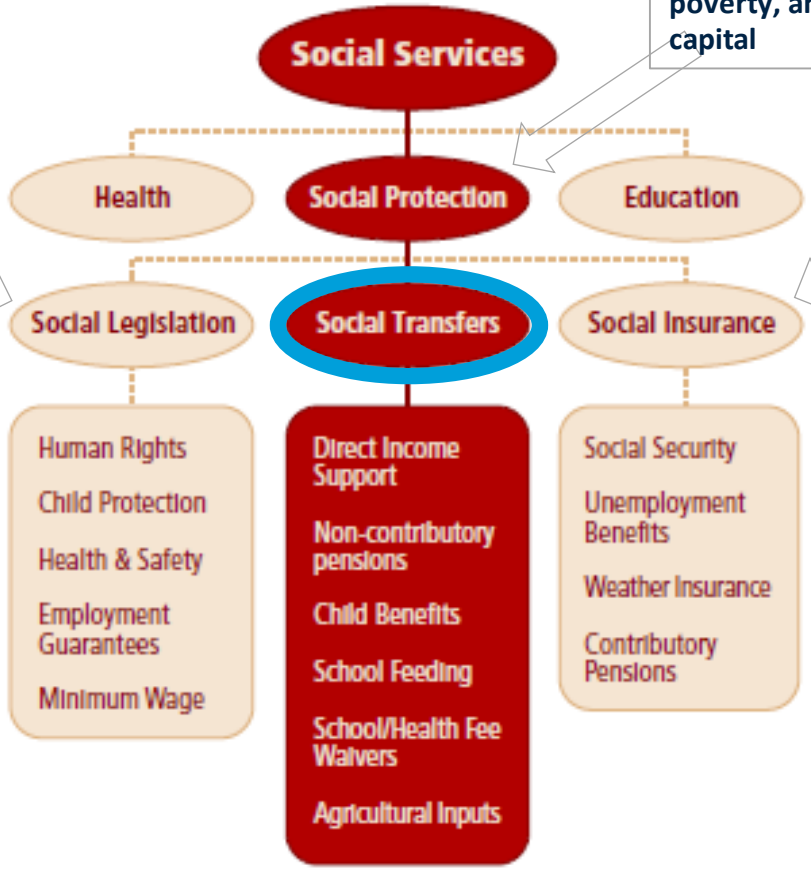
Source: ILO. 2017. "World Social Protection Report 2017-19: Universal social protection to achieve the Sustainable Development Goals". Geneva: International Labour Organization. <https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_604882.pdf>

Social protection taxonomy

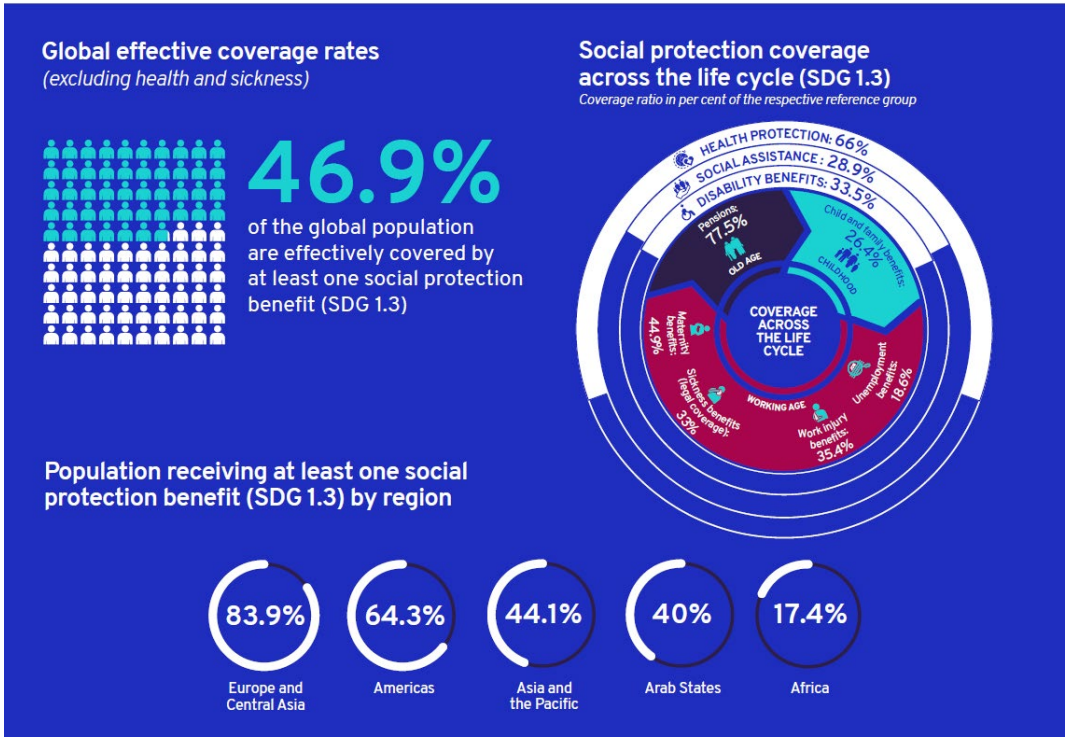
public actions to reduce risk, vulnerability and chronic poverty, and build human capital

protecting citizens' rights ensures minimum civic standards to safeguard individuals
- labour laws, health & safety standards

contributory transfers, compulsory
- old-age, disability/ survivorship pensions, unemployment



Global social protection coverage



Source: World Social Protection Report 2020-22: Social protection at the crossroads – in pursuit of a better future, ILO, Geneva, Switzerland

Global social funding gaps

The financing gap in social protection urgently needs to be closed to ensure at least minimum provision for all – a social protection floor

The financing gap has increased by approximately

30%

since the onset of the COVID-19 crisis

Lower-middle-income countries require an additional

US$362.9 billion

5.1% of GDP

Upper-middle-income countries require an additional

US$750.8 billion

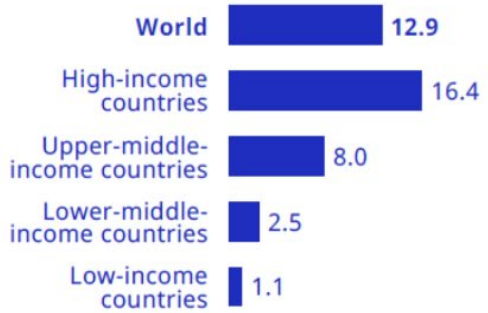
3.1% of GDP

Low-income countries require an additional

US$77.9 billion

15.9% of GDP

Public expenditure on social protection *(excluding healthcare)* **as % of GDP**



The persistence of protection gaps is associated with **significant underinvestment in social protection**

Source: World Social Protection Report 2020-22: Social protection at the crossroads – in pursuit of a better future, ILO, Geneva, Switzerland

Social protection delivery models

TB – sensitive social protection program

Not specifically target to TB patients, but that could have an impact on TB because they target groups and/ or people at high risk of TB (i.e. household members, HIV-coinfected patients, drug users, homeless) and/or vulnerable to its financial consequences

TB – specific social protection program

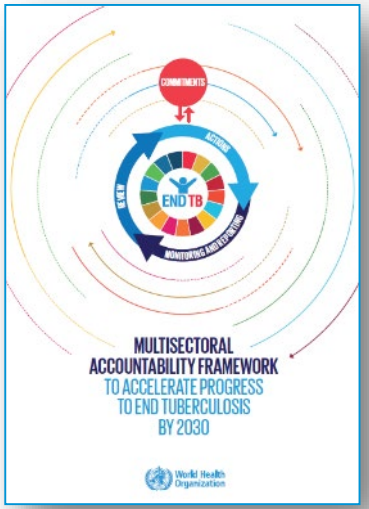
Specifically targeted at TB-patients with the precise intent to improve a TB indicator such as TB treatment outcomes

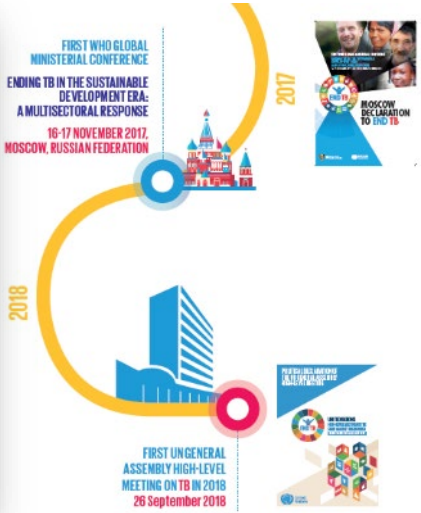
Social protection in the context of the End TB Strategy

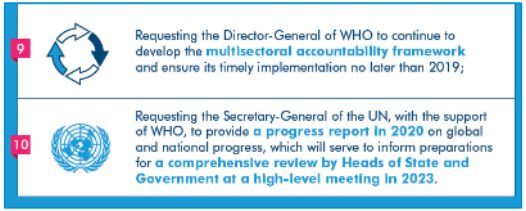
- Collaborate on TB/HIV activities and management of comorbidities
- Provide social and economic support to patients and affected households
- Reduce population level exposure to direct TB risk factors: undernourishment, harmful alcohol use, smoking, etc.

No TB-affected household face catastrophic costs by 2020

WHO Multisectoral Accountability Framework

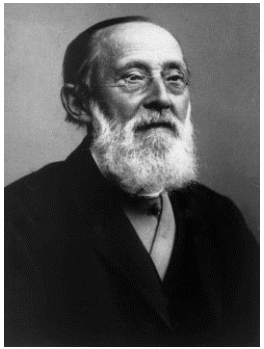






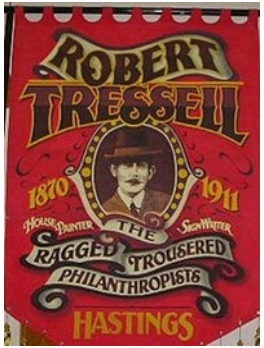
Launch and uptake since 2019

Social protection in TB history



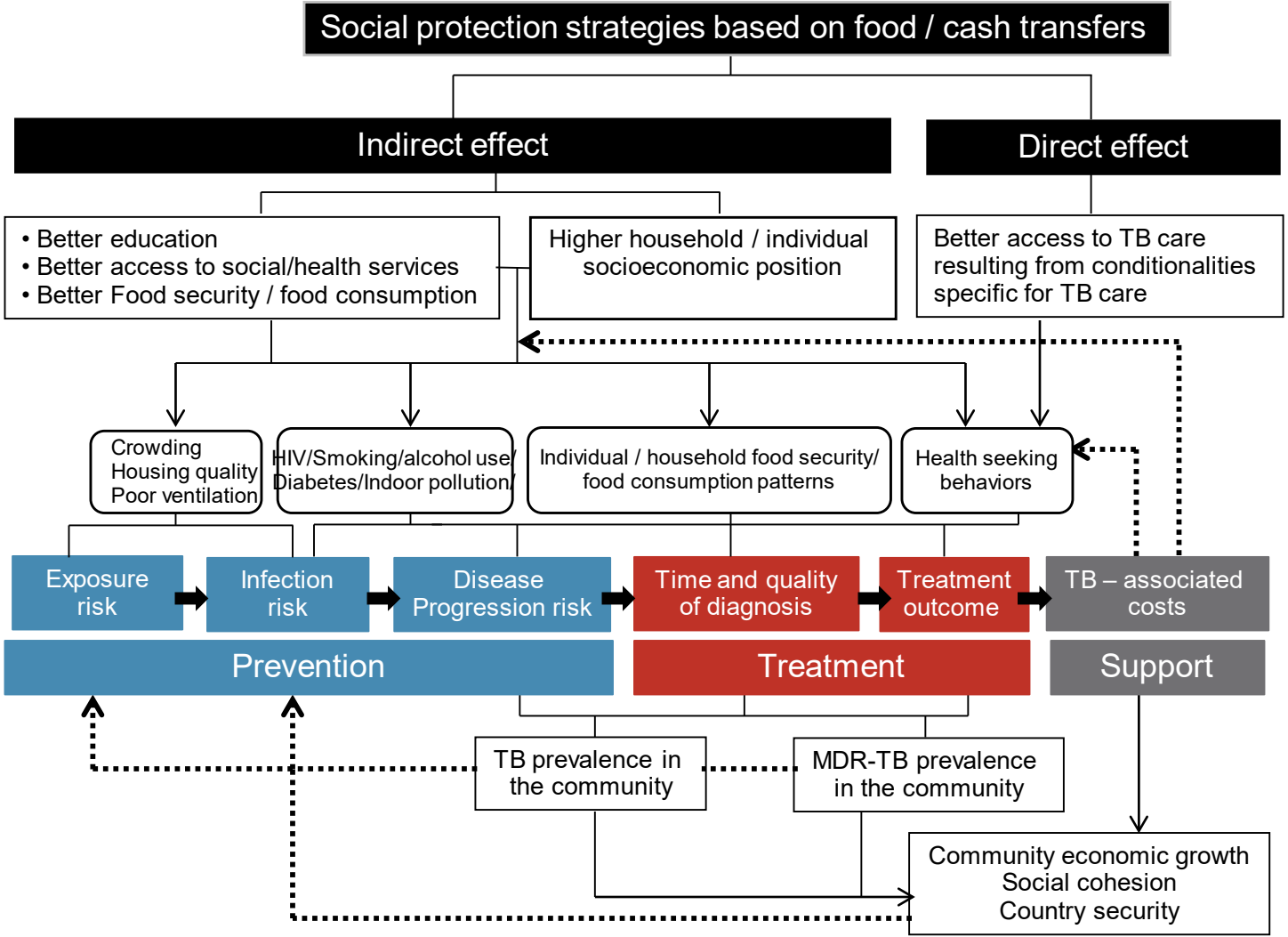
"TB is a social disease."
Rudolf Virchow, 1880s

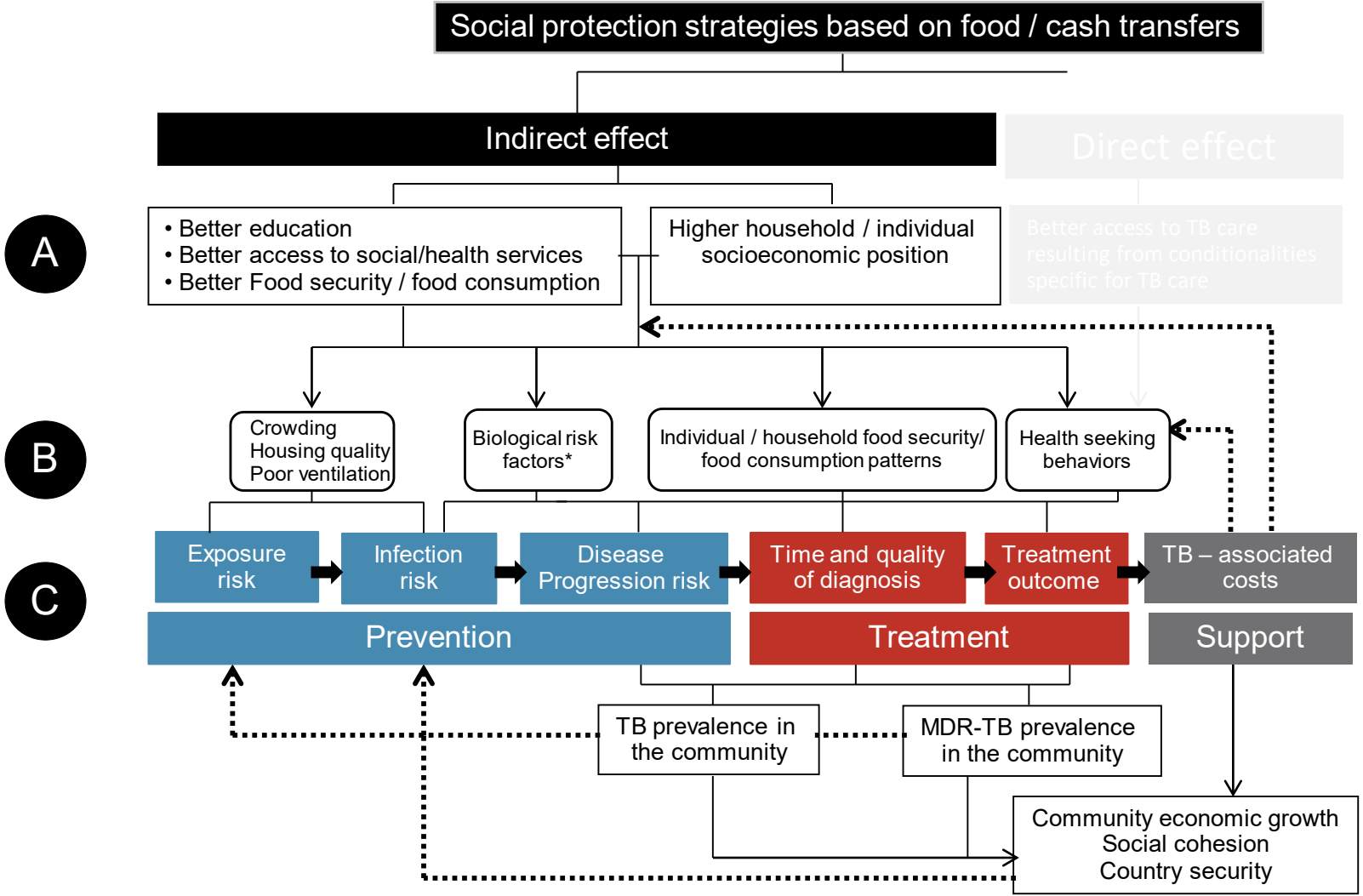
"One of the most powerful weapons we can use against TB is social welfare centres."
Robert Koch, 1890s



"Those who profess to be desirous of preventing and curing consumption must be either hypocrites or fools, for they ridicule the suggestion that it is necessary first to cure and prevent poverty."

Robert Tressell, 1912


Social protection strategies based on food / cash transfers
Indirect effect
Direct effect
• Better education
• Better access to social/health services
• Better Food security / food consumption
Higher household / individual socioeconomic position
Better access to TB care resulting from conditionalities specific for TB care
Crowding
Housing quality
Poor ventilation
HIV/Smoking/alcohol use/ Diabetes/Indoor pollution
Individual / household food security/ food consumption patterns
Health seeking behaviors
Exposure risk
Infection risk
Disease Progression risk
Time and quality of diagnosis
Treatment outcome
TB – associated costs
Prevention
Treatment
Support
TB prevalence in the community
MDR-TB prevalence in the community
Community economic growth
Social cohesion
Country security


Social protection strategies based on food / cash transfers
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Better access to TB care resulting from conditionalities specific for TB care
B
Crowding
Housing quality
Poor ventilation
Biological risk factors*
Individual / household food security/ food consumption patterns
Health seeking behaviors
C
Exposure risk
Infection risk
Disease Progression risk
Time and quality of diagnosis
Treatment outcome
TB – associated costs
Prevention
Treatment
Support
TB prevalence in the community
MDR-TB prevalence in the community
Community economic growth
Social cohesion
Country security

Social assistance and TB: an overview of the evidence

A

Distal factors

- Poverty and inequalities reduction
- Food consumption / food security improvement
- Better access / use of education / health systems services

Strong and consistent evidence

B

Intermediate / proximal factors

- Health seeking behaviours
- Exposure to behavioural/biological risk factors

Strong evidence on some but not all relevant risk factors

C

Direct impact on actual TB indicators

- TB incidence
- TB morbidity / mortality
- TB treatment compliance / TB cure
- TB costs mitigation

Good and consistent evidence

The impact on TB incidence

The impact of social protection and poverty elimination on global tuberculosis incidence: a statistical modelling analysis of Sustainable Development Goal 1

Daniel J Carter, Philippe Glaziou, Knut Lönnroth, Andrew Siroka, Katherine Floyd, Diana Weil, Mario Raviglione, Rein M G J Houben, Delia Boccia**

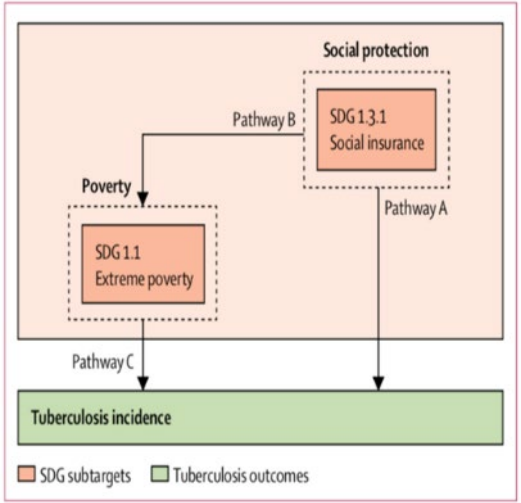
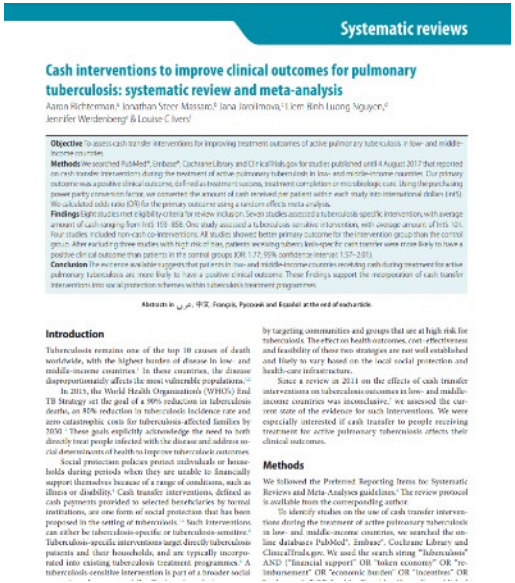


Figure 2: Reduced conceptual framework

	Expected annual proportional decrease
Pathway A: social protection for all (100% coverage)	8·7%
Pathway C: poverty elimination (100% eliminated)	2·0%
Pathway A and Pathway C: social protection and poverty elimination	11·1%
Pathways B + C: social protection via poverty elimination	1·8%
Pathway A and Pathways B + C: total effect of social protection	9·1%

The impact on treatment outcomes



Systematic reviews

Cash interventions to improve clinical outcomes for pulmonary tuberculosis: systematic review and meta-analysis

Aaron Richterman,[a] Jonathan Steer-Massaro,[b] Jana Jarolimova,[c] Liem Binh Luong Nguyen,[d] Jennifer Werdenberg[e] & Louise C Ivers[f]

Objective To assess cash transfer interventions for improving treatment outcomes of active pulmonary tuberculosis in low- and middle-income countries.

Methods We searched PubMed®, Embase®, Cochrane Library and ClinicalTrials.gov for studies published until 4 August 2017 that reported on cash transfer interventions during the treatment of active pulmonary tuberculosis in low- and middle-income countries. Our primary outcome was a positive clinical outcome, defined as treatment success, treatment completion or microbiologic cure. Using the pan-Africa power parity conversion factor, we converted the amount of cash received per patient with in each study into international dollars (Int$). We calculated odds ratio (OR) for the primary outcome using a random effects meta-analysis.

Findings Eight studies met eligibility criteria for review inclusion. Seven studies assessed a tuberculosis specific intervention, with average amount of cash ranging from Int$ 119–858. One study assessed a tuberculosis sensitive intervention, with average amount of Int$ 101. Four studies included non-cash co-interventions. All studies showed better primary outcome for the intervention group than the control group. After excluding three studies with high risk of bias, patients receiving tuberculosis-specific cash transfer were more likely to have a positive clinical outcome than patients in the control groups (OR: 1.77; 95% confidence interval: 1.57–2.01).

Conclusion The evidence available suggests that patients in low- and middle-income countries receiving cash during treatment for active pulmonary tuberculosis are more likely to have a positive clinical outcome. These findings support the incorporation of cash transfer interventions into social protection schemes within tuberculosis treatment programmes.

Abstracts in عربي, 中文, Français, Русский and Español at the end of each article.

Introduction

Tuberculosis remains one of the top 10 causes of death worldwide, with the highest burden of disease in low- and middle-income countries.[1] In these countries, the disease disproportionately affects the most vulnerable populations.[2]

In 2015, the World Health Organization's (WHO's) End TB Strategy set the goal of a 90% reduction in tuberculosis deaths, an 80% reduction in tuberculosis incidence rate and zero catastrophic costs for tuberculosis-affected families by 2030.[3] These goals explicitly acknowledge the need to both directly treat people infected with the disease and address social determinants of health to improve tuberculosis outcomes.

Social protection policies protect individuals or households during periods when they are unable to financially support themselves because of a range of conditions, such as illness or disability.[4] Cash transfer interventions, defined as cash payments provided to selected beneficiaries by formal institutions, are one form of social protection that has been proposed in the setting of tuberculosis.[5] Such interventions can either be tuberculosis-specific or tuberculosis-sensitive.[6] Tuberculosis-specific interventions target directly tuberculosis patients and their households, and are typically incorporated into existing tuberculosis treatment programmes.[6] A tuberculosis-sensitive intervention is part of a broader social by targeting communities and groups that are at high risk for tuberculosis. The effect on health outcomes, cost-effectiveness and feasibility of these two strategies are not well established and likely to vary based on the local social protection and health-care infrastructure.

Since a review in 2011 on the effects of cash transfer interventions on tuberculosis outcomes in low- and middle-income countries was inconclusive,[7] we assessed the current state of the evidence for such interventions. We were especially interested if cash transfer to people receiving treatment for active pulmonary tuberculosis affects their clinical outcomes.

Methods

We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.[8] The review protocol is available from the corresponding author.

To identify studies on the use of cash transfer interventions during the treatment of active pulmonary tuberculosis in low- and middle-income countries, we searched the online databases PubMed®, Embase®, Cochrane Library and ClinicalTrials.gov. We used the search string "Tuberculosis" AND ("financial support" OR "token economy" OR "reimbursement" OR "economic burden" OR "incentives" OR

OR = 1.77, 95%CI 1.57 – 2.01

Richterman, Bull WHO 2018

Effects of social protection on tuberculosis treatment outcomes in low or middle-income and in high-burden countries: systematic review and meta-analysis

Efeitos da proteção social sobre os desfechos do tratamento da tuberculose em países de renda baixa e média ou de carga alta da doença: uma revisão sistemática e meta-análise

Efectos de la protección social en los resultados del tratamiento contra la tuberculosis en países con baja o media renta y gravemente afectados: revisión sistemática y metaanálisis

Kaio Viniclus Freitas de Andrade Jorida Silva Nery Ramon Andrade de Souza Sussen Martins Pereira

ABOUT THE AUTHORS

Abstracts

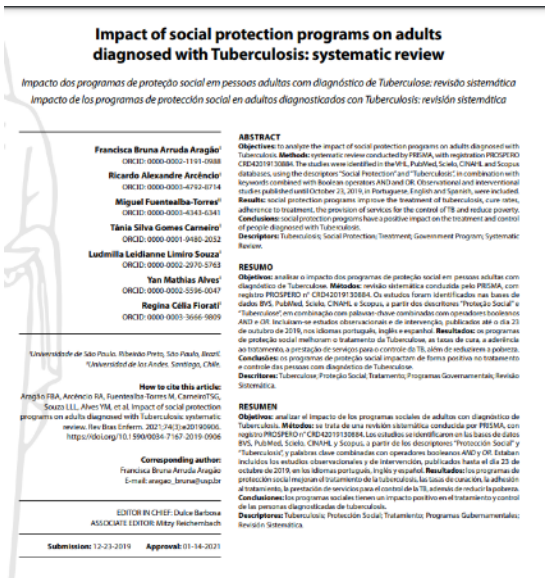
Tuberculosis (TB) is a poverty infectious disease that affects millions of people worldwide. Evidences suggest that social protection strategies (SPS) can improve TB treatment outcomes. This study aimes to synthesize such evidences through systematic literature review and meta-analyses. We searched for studies conducted in low- or middle-income and in high-TB-burden countries, published during 1966-2016. The review was performed by searching PubMed/MEDLINE, Scopus, Web of Science, ScienceDirect and LILACS. We included only studies that investigated the effects of SPS on TB treatment outcomes. We retained 25 studies for qualitative synthesis. Meta-analyses were performed with 9 randomized controlled trials, including a total of 1.667 participants. Pooled results showed that SPS was associated with TB treatment success (RR = 1.09; 95%CI: 1.03-1.14), cure of TB patients (RR = 1.11; 95%CI: 1.01-1.22) and with reduction in risk of TB treatment default (RR = 0.83; 95%CI: 0.45-0.89). We did not detect effects of SPS on the outcomes treatment failure and death. These findings revealed that SPS might improve TB treatment outcomes in lower middle income economies or countries with high burden of this disease. However, the overall quality of evidences regarding these effect estimates is low and further well-conducted randomized studies are needed.

Tuberculosis; Treatment Outcome; Social Welfare; Public Policy

A tuberculose (TB) é uma doença infecciosa associada à pobreza que afeta milhões de pessoas no mundo. As evidências sugerem que estratégias de proteção social podem melhorar os desfechos do tratamento da TB. O estudo teve como objetivo resumir essas evidências através de uma revisão sistemática da literatura e uma meta-análises. Foram buscados estudos realizados em países de renda baixa e média ou com carga alta de TB, publicados entre 1966 e 2016. A revisão foi realizada através de uma busca em PubMed/MEDLINE, Scopus, Web of Science, ScienceDirect e LILACS. Incluímos apenas os estudos que investigaram os efeitos das estratégias de proteção social sobre os desfechos do tratamento da TB. Foram incluídos 25 estudos na síntese qualitativa. As meta-análises foram realizadas com 9 estudos randomizados e controlados, totalizando 1.667 participantes. Os resultados mostraram que as estratégias de proteção social estavam associadas ao sucesso do tratamento da TB (RR = 1,09; IC95%: 1,03-1,14), a cura dos pacientes de TB (RR = 1,11; IC95%: 1,01-1,22) e à redução do risco de abandono do tratamento (RR = 0,62; IC95%: 0,45-0,89). Não detectamos os efeitos das estratégias de proteção social sobre a falha terapêutica ou mortalidade. Os achados revelam que as estratégias de proteção social podem melhorar os desfechos do tratamento em países com renda baixa e média ou com alta carga da doença. Entretanto, a qualidade das evidências com

RR = 1.09, 95%CI 1.03 – 1.14

Freitas de Andrade, Reports in Public Health, 2018



Impact of social protection programs on adults diagnosed with Tuberculosis: systematic review

Impacto dos programas de proteção social em pessoas adultas com diagnóstico de Tuberculose: revisão sistemática

Impacto de los programas de protección social en adultos diagnosticados con Tuberculosis: revisión sistemática

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How to cite this article:
Aragão FBA, Arcêncio RA, Fuentealba-Torres M, Carneiro TSG, Souza LLL, Alves YM, et al. Impact of social protection programs on adults diagnosed with Tuberculosis: systematic review. Rev Bras Enferm. 2021;74(3):e20190906. https://doi.org/10.1590/0034-7167-2019-0906

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Submission: 12-23-2019 **Approval:** 01-14-2021

ABSTRACT

Objectives: to analyze the impact of social protection programs on adults diagnosed with Tuberculosis. **Methods:** systematic review conducted by PRISMA, with registration PROSPERO CRD42019130884. The studies were identified in the VHL, PubMed, Scielo, CINAHL and Scopus databases, using the descriptors "Social Protection" and "Tuberculosis", in combination with keywords combined with Boolean operators AND and OR. Observational and interventional studies published until October 25, 2019, in Portuguese, English and Spanish, were evaluated. **Results:** social protection programs improve the treatment of tuberculosis, cure rates, adherence to treatment, the provision of services for the control of TB and reduce poverty. **Conclusions:** social protection programs have a positive impact on the treatment and control of people diagnosed with Tuberculosis.

Descriptors: Tuberculosis; Social Protection; Treatment; Government Program; Systematic Review.

RESUMO

Objetivos: analisar o impacto dos programas de proteção social em pessoas adultas com diagnóstico de Tuberculose. **Métodos:** revisão sistemática conduzida pelo PRISMA, com registro PROSPERO nº CRD42019130884. Os estudos foram identificados nas bases de dados BVS, PubMed, Scielo, CINAHL e Scopus, a partir dos descritores "Proteção Social" e "Tuberculose", em combinação com palavras-chave combinadas com operadores booleanos AND e OR. Incluíram-se estudos observacionais e de intervenção, publicados até o dia 23 de outubro de 2019, nos idiomas português, inglês e espanhol. **Resultados:** os programas de proteção social melhoram o tratamento da Tuberculose, as taxas de cura, a aderência ao tratamento, a prestação de serviços para o controle da TB, além de reduzir a pobreza. **Conclusões:** os programas de proteção social impactam de forma positiva no tratamento e controle das pessoas com diagnóstico de Tuberculose.

Descritores: Tuberculose; Proteção Social; Tratamento; Programas Governamentais; Revisão Sistemática.

RESUMEN

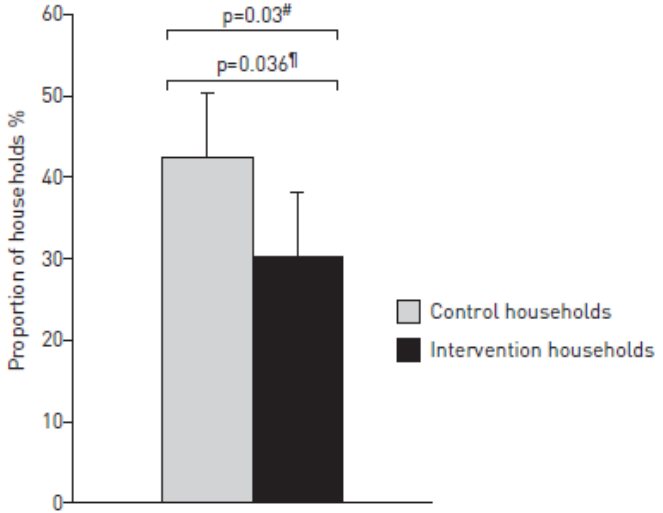
Objetivos: analizar el impacto de los programas sociales de adultos con diagnóstico de Tuberculosis. **Métodos:** se trata de una revisión sistemática conducida por PRISMA, con registro PROSPERO nº CRD42019130884. Los estudios se identificaron en las bases de datos BVS, PubMed, Scielo, CINAHL y Scopus, a partir de los descriptores "Protección Social" y "Tuberculosis", y palabras clave combinadas con operadores booleanos AND y OR. Estaban incluidos los estudios observacionales y de intervención, publicados hasta el día 23 de octubre de 2019, en los idiomas portugués, inglés y español. **Resultados:** los programas de protección social mejoran el tratamiento de la tuberculosis, las tasas de curación, la adhesión al tratamiento, la prestación de servicios para el control de la TB, además de reducir la pobreza. **Conclusiones:** los programas sociales tienen un impacto positivo en el tratamiento y control de las personas diagnosticadas de tuberculosis.

Descriptores: Tuberculosis; Protección Social; Tratamiento; Programas Gubernamentales; Revisión Sistemática.

OR = 2.9, 95%CI = 2.0- 4.3

Aragão, Rev Bras Enferm, 2021

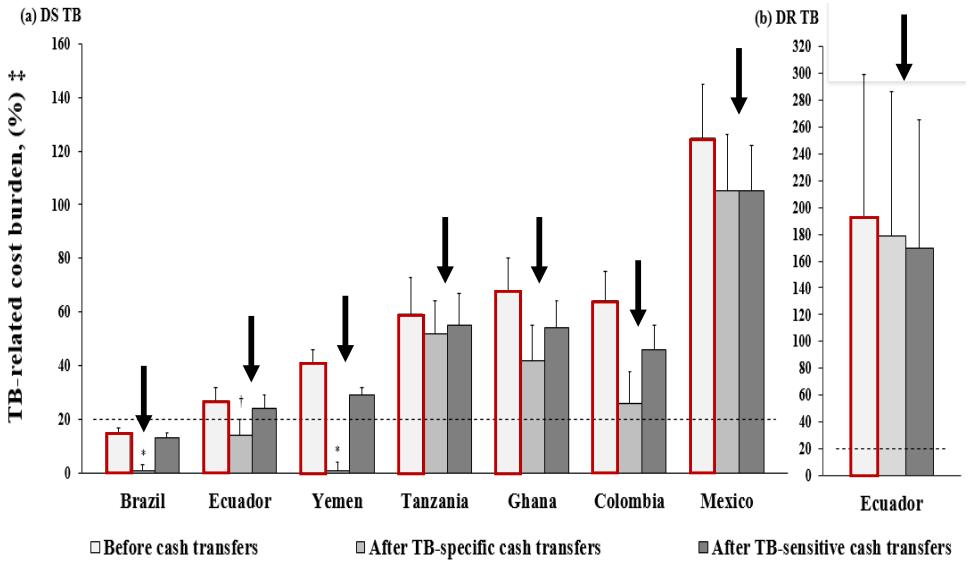
The impact on catastrophic costs



30% vs 42% of households incurring catastrophic costs

- 20% of total costs defrayed
- 39% of direct costs defrayed
- 19% of lost income defrayed

Wingfield et al, ERJ, 2016



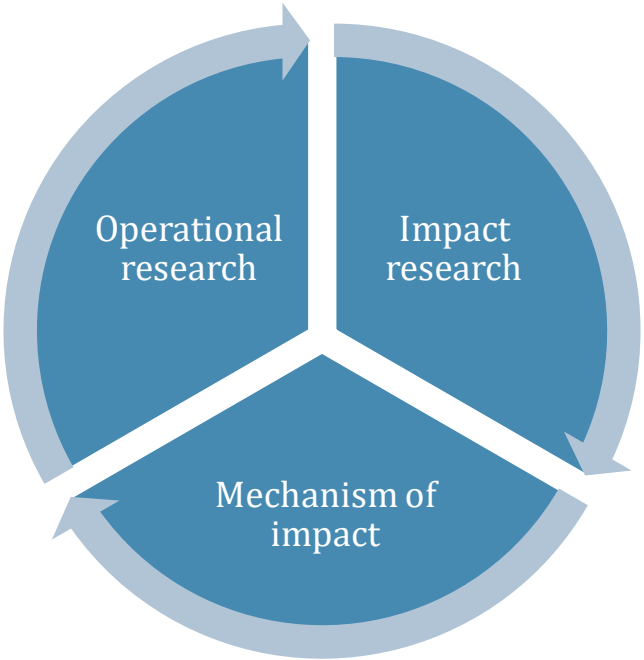
After receipt of cash transfers, there was a consistent and sometimes substantial reduction in the financial burden of average TB-related costs.

Rudgard et al, 2016, PloS Med

Knowledge gaps

- Still relatively **few evidence, but growing and consistent**.
- Largely provided by few, **scarcely representative countries** (mostly in Latin America).
- Potential impact hampered by still **unknown coverage** among TB patients and/or TB-affected communities.
- What is the **overall impact** in terms of TB elimination and also in terms of impoverishment?

Research domains on social protection and TB

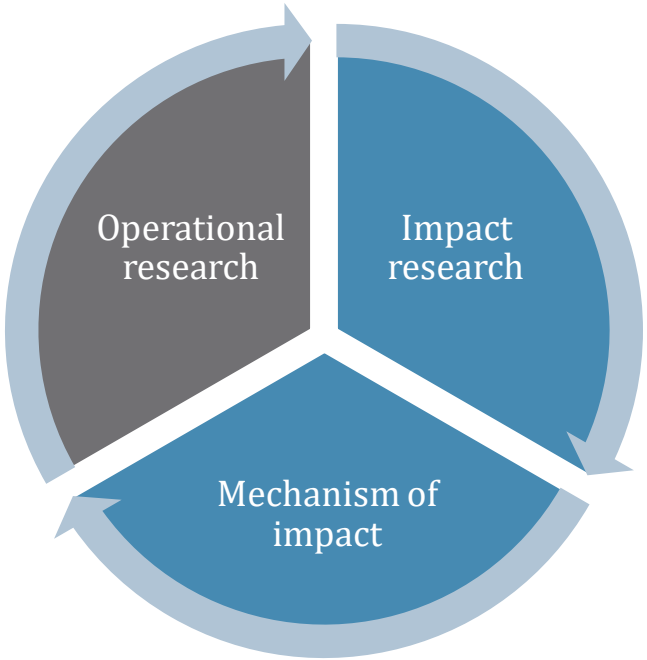


Research domains and research questions

Domains	Questions
Barriers access to social protection	1. What are the main barriers hampering access to social protection from TB-affected households/patients; 2. How can we best explore these barriers (i.e. qualitative or quantitative studies); 3. How these barriers can be programmatically overcome to enhance access from the most in need? 4. What social protection implementation strategies can best enhance access (i.e. TB-specific vs TB-sensitive programs)
Mechanism of impact	1. What are the causal pathways through which social protection may affect health. 2. What is the relative importance of these causal pathways; how this vary depending on the TB outcome, context and type of social protection intervention 3. Is it really possible to disentangle them or are they all linked to each other and how we can translate this complexity in measurable terms? 4. In the psychosocial pathway, can we consider mental health as a mediator of the impact of social protection on TB? 5. Can we introduce a life-course interpretation to our understanding of social protection and TB and answer the question on the extent to which children receiving social protection have a better health trajectory and better health outcomes as adults.
TB outcome of interest	1. What TB outcomes are more 'sensitive' to the impact of social protection (i.e. prevention, care or costs mitigation)? 2. Can we quantify this impact and what study designs are most suitable to achieve this objective (i.e. RCTs, quasi-experimental studies, microsimulations) 3. From a control perspective, what is the impact we're most interested (i.e. the one via reduced exposure (I), the one via reduced transmission (II, and valid only for communicable diseases); the one via reduced susceptibility (III), the one via reduced vulnerability to the consequences of ill-health? 4. What is the role of social protection in the containment of the direct and indirect health effects of a pandemic?

Operational knowledge gaps

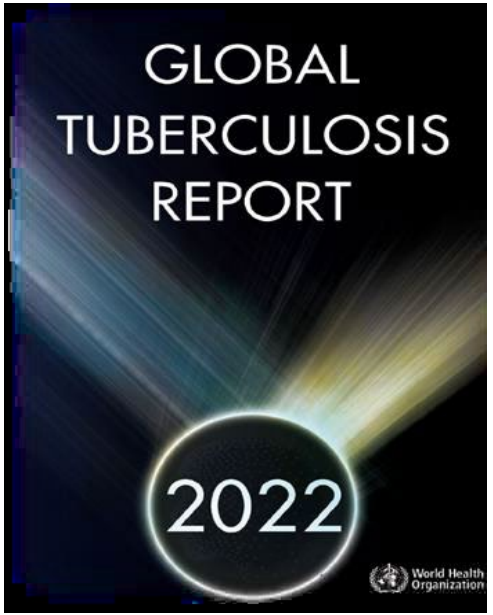
- What barriers and social protection needs TB-patients experience both at individual and structural level?
- What strategies can be designed to make social protection programs more TB-inclusive?
- What may be the projected impact on TB and poverty indicators of a more TB-inclusive social protection program?
- What partnership models can be established between TB services and social protection programmatic activities?



Social protection and TB policies

- Only 16 of the 30 TB HBCs have a national policy on social protection for people with TB.
- Free access to medical services is the most commonly-used measure (15/16 countries);
- At least one other form of social protection (such as cash transfers, treatment enablers, support with food security) is provided in 14 countries.

Country	National policy specifically related to people with TB	Services provided to people with TB				
		Free access to medical services	Enablers to support adherence to treatment	Conditional cash-transfers	Measures to support food security	Targeting
Angola						
Bangladesh						
Brazil						Individuals considered highly vulnerable
Central African Republic						
China						
Congo						
Democratic People's Republic of Korea						
Democratic Republic of the Congo						
Ethiopia						
Gabon						
India						
Indonesia						Family members of a TB patient who are school age
Kenya						
Lesotho						
Liberia						People with drug-resistant TB
Mongolia						
Mozambique						
Myanmar						
Namibia						
Nigeria						
Pakistan						
Papua New Guinea						
Philippines						
Sierra Leone						
South Africa						
Thailand						
Uganda						
United Republic of Tanzania						
Viet Nam						
Zambia						People with drug-resistant TB



Thank you for your attention

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