# Introduction

Tobacco claims more than 7 million lives each year and about $2 trillion in healthcare costs and lost productivity.[1](https://paperpile.com/c/I7gPiA/hgjt7) Over 80% of the world’s 1.3 billion tobacco users live in low- and middle-income countries (LMICs), where the TB burden is also substantial.[2](https://paperpile.com/c/I7gPiA/W7Edq) A recent study in South Asian countries estimated that smoked tobacco rates are higher among TB patients than the general population.[3](https://paperpile.com/c/I7gPiA/nA21y) Despite treatment with anti-TB medication, patients who smoke face poorer outcomes, including delays in sputum conversion, treatment failure, risk of recurrence/relapse, developing multidrug resistance and dying from TB.[4](https://paperpile.com/c/I7gPiA/1iPUF)

# Significance of tobacco cessation in TB patients

Diagnosis of TB can be a strong predictor of tobacco quitting behaviour, as it provides a teachable moment when patients are most receptive to advice on lifestyle modification.[5](https://paperpile.com/c/I7gPiA/Nj52F) TB patients who use tobacco come into frequent contact with healthcare systems, creating strong opportunities to assist their quitting. TB care settings must therefore actively address tobacco use, particularly by encouraging and supporting patients to quit.

The majority of TB patients who smoke want to quit (98%),[3](https://paperpile.com/c/I7gPiA/nA21y) but find it hard to do so on their own as smoking is extremely addictive. Unaided quit rates are generally low – about 5% over a year, while even simple cessation support can increase this to 10-20%.[6](https://paperpile.com/c/I7gPiA/2UZxb) Affordable and effective interventions for smoking cessation in healthcare settings include brief advice from health workers, telephone helplines, automated text messaging, printed self-help materials, and pharmacotherapies such as Cytisine and Nortriptyline.[6](https://paperpile.com/c/I7gPiA/2UZxb) Some of these have also been evaluated in TB contexts and found to be highly successful. For example, behavioural support aimed at helping TB patients in LMICs change unhealthy habits by modifying their health beliefs and attitudes, have demonstrated quit rates as high as 40%.[7,8](https://paperpile.com/c/I7gPiA/QhTgn%2B7Dozn) Pharmacotherapies such as Bupropion and Cytisine when added to behavioural support, did not show a significant effect in this patient group and needs further evaluation.[7,8](https://paperpile.com/c/I7gPiA/QhTgn%2B7Dozn)

# Integration of tobacco cessation in routine TB care – challenges and opportunities

In general, the large majority of evidence points towards the feasibility of delivering tobacco cessation in routine TB care, but barriers at various levels hinder their optimal implementation. TB patients who visit treatment facilities may face stigma in society, and not want to engage in cessation activities that increase their time in hospital.[9](https://paperpile.com/c/I7gPiA/clnUd) Without adequate infection control measures in TB treatment facilities, there may also be concerns regarding the risk to healthcare personnel of contracting infection during the delivery of cessation interventions.[10](https://paperpile.com/c/I7gPiA/GLkL2) At the systems level, lack of cultural norms such as ‘patient-centred approach’ or ‘shared-decision making’ can deter providers from engaging in conversations about changing patients’ smoking behaviours.[11](https://paperpile.com/c/I7gPiA/HUfUG) But implementing personnel themselves may not have a large influence on cessation results, so TB programmes may be able to customise cessation services according to their needs and limitations.[12](https://paperpile.com/c/I7gPiA/eS9Q2)The need for contextual adaptation of interventions including cultural/language tailoring, fostering environments conducive to tobacco cessation, and securing mandates from higher authorities remain important considerations for successful integration of tobacco cessation in routine TB care.[11](https://paperpile.com/c/I7gPiA/HUfUG)

Specific challenges noted by cessation service providers relate to the complexity of behavioural interventions (e.g. ‘length’- duration and number of sessions, and ‘breadth’- number of behaviour change elements offered), as well as low levels of provider motivation and support.[11](https://paperpile.com/c/I7gPiA/HUfUG) Using a patient-facing chart for communicating key messages was considered a straight-forward and intuitive approach, but interpersonal interaction techniques, such as emphasising patient choice, reflective listening, and tailoring individual advice, were found to be much harder to adopt.[11,13,14](https://paperpile.com/c/I7gPiA/0Mk3M%2BGDgG6%2BHUfUG). Therefore, in training healthcare personnel on delivering tobacco cessation interventions, moving away from didactic, classroom style sessions to more interactive approaches, whereby providers can act out interpersonal communications and information exchange techniques (through roleplay, etc.), can prove useful in building provider self-efficacy.[11](https://paperpile.com/c/I7gPiA/HUfUG) In addition, better alignment of cessation support activities with various providers’ roles and receptivity, may be key to overcoming the systemic barriers for successful planning and integration of tobacco cessation services in routine TB care.

# Policy environment for tobacco cessation in LMICs

From a policy angle, the World Health Organisation (WHO) Framework Convention on Tobacco Control (FCTC) provides a comprehensive range of supply and demand reduction measures for global tobacco control. Article 14 of the FCTC requires countries that are party to the convention to provide evidence-based tobacco cessation treatments.[15](https://paperpile.com/c/I7gPiA/JOQbU) However, progress in implementation has been particularly slow on this aspect, with several countries not even having an official national strategy for treating tobacco dependence.[16](https://paperpile.com/c/I7gPiA/men9r) Additionally, there exists a signiﬁcant gradient in implementation across different countries by their income levels, with far fewer provisions for tobacco cessation in LMIC contexts. Further, partial or non-adherence to other tobacco control policies such as smoke-free policies in these countries, allow the visibility of smoking inside healthcare facilities, and can present major barriers to fostering environments that are conducive to the delivery of smoking cessation services.[11](https://paperpile.com/c/I7gPiA/HUfUG)

Comprehensive policy and practice guidelines for tobacco cessation have been developed specifically for TB programmes in LMICs.[17](https://paperpile.com/c/I7gPiA/aP7Kt) But for the effective implementation of these policies and to avoid wider inequalities in accessing tobacco cessation services across countries, greater support from policymakers and national TB programmes in LMICs are urgently needed.

# Way forward

In summary, we know that effective interventions exist to help smokers quit, and that some of these are also highly successful in TB patients. However, implementation needs to be improved, with an emphasis on overcoming the identified challenges and integrating affordable, broad-reaching, tobacco cessation interventions into existing healthcare systems,[18](https://paperpile.com/c/I7gPiA/QTbty) including TB treatment settings. Cessation provisions may be further extended to TB patients within community settings, but this will require collaborations beyond health workers to treatment supporters, peers and the media.[19](https://paperpile.com/c/I7gPiA/HXqAI) We offer the following as recommendations for policy, practice and future research in this area –

## Policy recommendations

With regard to FCTC Article 14, building tobacco control capacity, including for research and advocacy, is a major priority for health in LMICs. More countries should start with conducting a national situation analysis, and also develop and implement evidence-based tobacco cessation strategies to suit their specific contexts.[18](https://paperpile.com/c/I7gPiA/QTbty) Governments around the world could and should do more to take advantage of the WHO FCTC as a tool to advance globally agreed health, development and human rights objectives.[20](https://paperpile.com/c/I7gPiA/AoQcA) Further, policy makers should facilitate greater collaboration between tobacco and TB initiatives to maximize results in low-resource settings.

## Practice and research recommendations

Integrating tobacco cessation within TB programmes offers a viable solution to reduce the TB and tobacco related disease burden. To this effect, we make the following recommendations:[21](https://paperpile.com/c/I7gPiA/ZtJCZ)

* Mandate the recording and reporting of tobacco use status for all TB patients
* Train TB workers to provide brief cessation advice, including for patients who may face stigma
* Support healthcare workers in quitting tobacco use themselves

Specific areas of research to promote the integration of behavioural interventions for tobacco cessation within health systems in LMICs include:[22](https://paperpile.com/c/I7gPiA/ovqq0)

* Simplifying content of behavioural interventions for tobacco cessation
* Developing core competency training in treatment delivery approaches for providers, and
* Promoting approaches that enhance patient communication

We additionally suggest research to assess the effects of tobacco cessation on TB treatment outcomes, as this could inform the revision of treatment guidelines.[23](https://paperpile.com/c/I7gPiA/OYfYN) Besides smoking, being cognizant of smokeless tobacco use is equally important, given their disproportionately high prevalence in LMIC contexts. But the association between other forms of tobacco and TB disease and treatment outcomes needs further study.

Ending the TB epidemic by 2030 is among the key targets of the United Nations (UN) Sustainable Development Goals (SDGs). This would not be possible without effectively tackling tobacco use in TB patients.

# Acknowledgements

Author contributions: All authors have accepted responsibility for the entire content of this submitted manuscript and approved submission.

Funding: Authors state no funding involved.

Conflict of interest: Authors state no conflict of interest.

Ethics statement: Primary data for humans or animals were not collected for this report.

#

# References

1. [Drope J, Schluger N, Cahn Z, Drope J, Hamill S, Islami F, Liber A, Nargis N, Stoklosa M. The Tobacco Atlas, 6th edition. American Cancer Society and Vital Strategies; 2018.](http://paperpile.com/b/I7gPiA/hgjt7)

2. [WHO. Tobacco: Fact sheets [Internet]. World Health Organisation. 2020 [cited 2020 Jul 24];Available from:](http://paperpile.com/b/I7gPiA/W7Edq) <https://www.who.int/news-room/fact-sheets/detail/tobacco>

3. [Marshall A-M, Barua D, Mitchell A, et al. Smoking prevalence among tuberculosis patients: A crosssectional study in Bangladesh and Pakistan. Tob Induc Dis 2020;18:70.](http://paperpile.com/b/I7gPiA/nA21y)

4. [Slama K, Chiang CY, Enarson DA, et al. Tobacco and tuberculosis: a qualitative systematic review and meta-analysis [Review Article]. Int J Tuberc Lung Dis 2007;11(10):1049–61.](http://paperpile.com/b/I7gPiA/1iPUF)

5. [Elsey H, Dogar O, Ahluwalia J, Siddiqi K. Predictors of cessation in smokers suspected of TB: Secondary analysis of data from a cluster randomized controlled trial [Internet]. Drug and Alcohol Dependence. 2015;155:128–33. Available from:](http://paperpile.com/b/I7gPiA/Nj52F) <http://dx.doi.org/10.1016/j.drugalcdep.2015.08.002>

6. [West R, Raw M, McNeill A, et al. Health-care interventions to promote and assist tobacco cessation: a review of efficacy, effectiveness and affordability for use in national guideline development. Addiction 2015;110(9):1388–403.](http://paperpile.com/b/I7gPiA/2UZxb)

7. [Siddiqi K, Khan A, Ahmad M, et al. Action to stop smoking in suspected tuberculosis (ASSIST) in Pakistan: a cluster randomized, controlled trial. Ann Intern Med 2013;158(9):667–75.](http://paperpile.com/b/I7gPiA/QhTgn)

8. [Dogar O, Keding A, Gabe R, et al. Cytisine for smoking cessation in patients with tuberculosis: a multicentre, randomised, double-blind, placebo-controlled phase 3 trial. Lancet Glob Health 2020;8(11):e1408–17.](http://paperpile.com/b/I7gPiA/7Dozn)

9. [Courtwright A, Turner AN. Tuberculosis and stigmatization: pathways and interventions. Public Health Rep 2010;125 Suppl 4:34–42.](http://paperpile.com/b/I7gPiA/clnUd)

10. [Uden L, Barber E, Ford N, Cooke GS. Risk of Tuberculosis Infection and Disease for Health Care Workers: An Updated Meta-Analysis [Internet]. Open Forum Infectious Diseases. 2017;4(3). Available from:](http://paperpile.com/b/I7gPiA/GLkL2) <http://dx.doi.org/10.1093/ofid/ofx137>

11. [Dogar O, Elsey H, Khanal S, Siddiqi K. Challenges of Integrating Tobacco Cessation Interventions in TB Programmes: Case Studies from Nepal and Pakistan [Internet]. Journal of Smoking Cessation. 2016;11(2):108–15. Available from:](http://paperpile.com/b/I7gPiA/HUfUG) <http://dx.doi.org/10.1017/jsc.2015.20>

12. [Whitehouse E, Lai J, Golub JE, Farley JE. A systematic review of the effectiveness of smoking cessation interventions among patients with tuberculosis. Public Health Action 2018;8(2):37–49.](http://paperpile.com/b/I7gPiA/eS9Q2)

13. [Kelley JM, Kraft-Todd G, Schapira L, Kossowsky J, Riess H. The influence of the patient-clinician relationship on healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. PLoS One 2014;9(4):e94207.](http://paperpile.com/b/I7gPiA/0Mk3M)

14. [Warsi S, The TB & Tobacco consortium, Elsey H, et al. Using behaviour change theory to train health workers on tobacco cessation support for tuberculosis patients: a mixed-methods study in Bangladesh, Nepal and Pakistan [Internet]. BMC Health Services Research. 2019;19(1). Available from:](http://paperpile.com/b/I7gPiA/GDgG6) <http://dx.doi.org/10.1186/s12913-019-3909-4>

15. [World Health Organization. WHO Framework Convention on Tobacco Control: Guidelines for Implementation of Article 5. 3, Articles 8 To 14. World Health Organization; 2013.](http://paperpile.com/b/I7gPiA/JOQbU)

16. [Nilan K, Raw M, McKeever TM, Murray RL, McNeill A. Progress in implementation of WHO FCTC Article 14 and its guidelines: a survey of tobacco dependence treatment provision in 142 countries. Addiction 2017;112(11):2023–31.](http://paperpile.com/b/I7gPiA/men9r)

17. [Slama K, Chiang C-Y, Enarson DA. Tobacco cessation interventions for tuberculosis patients: a guide for low-income countries. International union against tuberculosis and lung disease; 2008.](http://paperpile.com/b/I7gPiA/aP7Kt)

18. [Raw M, Ayo-Yusuf O, Chaloupka F, et al. Recommendations for the implementation of WHO Framework Convention on Tobacco Control Article 14 on tobacco cessation support. Addiction 2017;112(10):1703–8.](http://paperpile.com/b/I7gPiA/QTbty)

19. [Rutebemberwa E, Nyamurungi K, Joshi S, Olando Y, Mamudu HM, Pack RP. Health Workers’ Perceptions on Where and How to Integrate Tobacco use Cessation Services into Tuberculosis Treatment; A Qualitative Exploratory Study in Uganda. 2020;Available from:](http://paperpile.com/b/I7gPiA/HXqAI) <https://www.researchsquare.com/article/rs-71580/latest.pdf>

20. [Huber L, Cuadrado U, Fernandez-Megina R, Raw M, Marquizo AB, Romeo-Stuppy K. The impact of COVID-19 on the WHO FCTC, cessation, and tobacco policy. Tob Induc Dis 2020;18:102.](http://paperpile.com/b/I7gPiA/AoQcA)

21. [Siddiqi K, Dogar O. TB and Tobacco - An Unholy Alliance. Pak J Chest Med 2018;24(1):01–3.](http://paperpile.com/b/I7gPiA/ZtJCZ)

22. [Dogar OF, Mdege ND. Integrating tobacco treatment interventions in routine healthcare. Public Health Forum 2020;252–4.](http://paperpile.com/b/I7gPiA/ovqq0)

23. [Jeyashree K, Kathirvel S, Shewade HD, Kaur H, Goel S. Smoking cessation interventions for pulmonary tuberculosis treatment outcomes. Cochrane Database Syst Rev 2016;(1):CD011125.](http://paperpile.com/b/I7gPiA/OYfYN)