

Tobacco Cessation Research in Low- and Middle-Income Countries: A commentary on Challenges, Innovations and Opportunities

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ABSTRACT

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Tobacco use (predominantly smoking) is the leading cause of preventable disease, disability, and death worldwide. It increases the risk of cancer, heart disease, stroke, chronic lung disease, and tuberculosis, among others, costing healthcare systems billions in direct medical costs each year.¹ Global tobacco use has declined from 22.7% in 2007 to 17% in 2021 but the total number of people who use tobacco remains high due to population growth,¹ leading to more than 8 million tobacco-related premature deaths yearly. Half of these deaths currently occur in high-income countries (HICs) due to the 50-year lag period between tobacco use initiation and death.² More than 80% of the world's 1.3 billion people who use tobacco now live in low- and middle-income countries (LMICs),³ where an exponential increase in tobacco-related deaths is anticipated to occur in the next 30 to 50 years. LMICs are not yet fully able to benefit from the global progress in tobacco control because they lag behind that in HICs, due to the disparity in access to comprehensive anti-tobacco programmes, which will further exacerbate this extremely rapid increase in tobacco-related deaths in the future. Moreover, certain groups in LMICs (e.g., men, low income and low education) report the highest tobacco use rates leading to a disproportionate burden of tobacco-related disease requiring targeted efforts.⁴ To avert a future public health disaster in LMICs including tobacco-related disease disparities, many millions of people who currently use tobacco need to be supported to quit. Article 14 of the WHO Framework Convention on Tobacco Control promotes the implementation of tobacco cessation strategies that are based on scientific evidence and best practices that take into account national circumstances and priorities.⁵ However, only limited evidence on tobacco dependence treatments that work in LMICs exists. Despite this gap, investment in cessation research in LMICs remain woefully deficient, in scale and scope. We describe some of the challenges facing tobacco cessation research in LMICs but also highlight examples of innovation and opportunities that LMICs have to offer to other contexts for design and implementation of effective cessation strategies.

THE CURRENT CONTEXT AND CHALLENGES

To fully grasp the depth of the unique challenges faced by LMICs in conducting cessation research, it is critical to understand the context that shapes tobacco control policies and practices in these countries. First, LMICs are stuck in the epidemiologic transition, having to battle a dual burden of disease due to communicable and non-communicable diseases (NCDs) that are emerging with the

rapid globalisation and urbanisation leading to dietary and lifestyle shifts in these countries.⁶ Unless stemmed, a future wave of disease and death from tobacco use will have massive adverse consequences. Second, tobacco industry interference in tobacco control efforts is commonplace in LMICs and remains a key obstacle to further implementation of tobacco control policies.⁷ Weakly enforced policies hinder motivation to quit when tobacco is readily available and affordable, compounded by diversification of tobacco products and aggressive tobacco industry marketing and promotion targeting women and young people. The economic and environmental implications of tobacco farming in LMICs further contribute to the challenging context in which cessation efforts must be given attention.⁸ Within the wider context of the above challenges and the need for research to counter tobacco industry tactics, the following areas should be a particular focus for cessation research in LMICs to promote timely and appropriate tobacco cessation strategies.

First, the *diverse range of tobacco products*, other than cigarettes, commonly consumed in LMICs have received limited cessation research attention. For example, smokeless tobacco (ST, placed in the mouth to suck or chew) is highly addictive and often has hazardous levels of nitrosamines and other toxic additives leading to a higher disease and risk burden in LMICs.⁹ Yet, scant research has been done to identify effective, acceptable, and affordable cessation strategies that can be delivered at scale for ST.¹⁰ The introduction of capsule cigarettes, and modernising the use of loose tobacco and waterpipe tobacco to reintroduce these in young people, are examples of how the market is rapidly changing, particularly in unregulated markets as is the case in most LMICs. Research into these products and effective behavioural and pharmacological treatments to support people to quit should take into account the drivers and complexity of use, such as use that may be strongly normalised with cultural identity and social connection, for example with ST, and the growing popularity of shisha and loose tobacco use among young people.¹¹

Second, the limited *policy research addressing issues such as the widespread use of the term 'smoking'* in public health messaging, international tobacco control guidelines and legislation in some jurisdictions, has often led to misclassification of products such as ST as food rather than tobacco.¹²

Third, the *health consequences of tobacco use in LMICs have been largely misunderstood*, which has had implications for local policy and practice. For example, tuberculosis (TB) has often been

overlooked in major international reports on the health consequences of tobacco, although it accounts for equal proportions of tobacco-related deaths to those caused by cardiovascular diseases in countries like India and South Africa. This is in part due to limited research on how tobacco affects treatment outcomes of infectious diseases as these are less prevalent in HICs but also because such consequences of tobacco use have not been effectively disseminated to policy makers.¹³ The same is true for people living with HIV who use tobacco because tobacco use can undermine the benefits of HIV treatment and cause them to lose more than six years of life expectancy, possibly outweighing the loss from HIV infection itself.¹⁴ Similarly, ST is the predominant form of tobacco used in many LMICs and oral cancers have the highest incidence rates in South Asia.^{15,16}

Fourth, evidence-based *cessation aids* like Nicotine Replacement Therapy (NRT) are not widely available in many LMICs and, where available, are too expensive for out-of-pocket payments. Varenicline may become more accessible now that it is off-patent if the production of generics can meet demand. Other effective cessation treatments like cytisine, with fewer side effects than varenicline, and potentially better affordability, are also not accessible in LMICs.¹⁷ Research into the reasons and solutions for why pharmacotherapies are not available, specifically the lack of NRT in many LMICs, despite being on the WHO Essential Medicines list for many years, is needed.

INNOVATIONS AND OPPORTUNITIES

We now consider how research in LMICs has underpinned opportunities for innovation in tobacco cessation and for cross-fertilising in HICs. A key finding from the few cessation effectiveness studies in LMICs is that a combination of behavioural interventions and pharmacotherapy did not show better outcomes than behavioural interventions alone, especially in HIV and TB patients, except a recent study in Kenya showing the efficacy of Bupropion and a culturally tailored intensive behavioural intervention (Supplementary Table 1). This could be due to the TB (and/or HIV) patients having a stronger intrinsic motivation to quit due to their clinical condition or the lower levels of nicotine dependence observed in the study populations compared to those in HICs, as heavier use of tobacco may be more likely to benefit from pharmacotherapy by attenuating withdrawal symptoms compared to lighter use of tobacco.¹⁸ Although further research on the effectiveness of tobacco cessation strategies and research into understanding the patterns of nicotine dependence and people's

motivations to quit in LMICs context are needed, these studies highlight that behavioural support for cessation is relatively effective and cost-effective in these countries.

Instead of standalone or dedicated tobacco cessation services, using lay health workers or health professionals to promote tobacco treatments in LMICs is one of the implementation innovations evidenced in these studies. Building cessation support in existing public health programmes, such as TB/HIV, NCDs, Diabetes, and mental health programmes, as well as primary healthcare and dental services, in LMICs presents a viable solution to reaching many people who use tobacco in a resource-constrained setting. Although relatively few, evidence-based cessation interventions trialled in LMICs offer the potential for adaptation and application to health systems elsewhere, including in HICs.

Research-based innovations in digital tools for cessation support have been pioneered and trialled at scale in LMICs. Examples include m-Cessation (India), mQuit app (Malaysia), mTB-Tobacco (Pakistan) and mCessation for HIV patients (Cambodia) (Supplementary Table 1).

Finally, the biggest challenge hindering research and innovation on tobacco cessation in LMICs is limited access to resources and a lack of research capacity. Both reflect historic and current inequities. They need to be turned around urgently if the future tide of tobacco-related deaths and disease in LMICs is to be addressed. Partnerships with better-resourced HIC research groups that genuinely build capacity and capability can help.¹⁹ Global and regional research funders should make cessation research - with an emphasis on pragmatic, implementation-focused research - a priority.²⁰

IMPLICATIONS

To have a global impact on the tobacco use pandemic, nicotine and tobacco research must broaden its vision beyond wealthy countries to include research and researchers in LMICs, where the vast majority of the world's people who use tobacco live. With limited access to financial resources, sometimes weak institutional support and undeveloped policy environments, tobacco cessation researchers in LMICs may struggle to initiate and sustain their research efforts. At the same time, their ability to innovate can provide ideas and inspiration for new approaches.

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OD reports current research grants from the National Institute for Health and Care Research, UK, the University of York (via Sparks programme) and the current position as Associate Professor of Global Public Health. OD serves as Associate Editor for the Nicotine & Tobacco Research Journal.

ASAN is an advisory board member for Bedfont Scientific Ltd and Co-chair for the ASEAN Advisory Board for Smoking Cessation. ASAN has received honoraria for educational engagements from Johnson and Johnson, Kenvue Inc, Lundbeck, Boehringer Ingheim, Eisai, Pfizer, DKSH and Sumitomo within the last 5 years.

JB serves in the Ministry of Health and Social Assistance of Guatemala.

OA reports research grants from the Bill and Melinda Gates Foundation through the Africa Capacity Building Foundation to develop capacity of African scholars in tobacco control research and to build capacity of tobacco control advocates and policymakers in 12 African countries on tobacco industry monitoring and countering industry interference in policy process. OA currently serves as a technical expert representing the government on a task team with other social partners to discuss the current Tobacco products and Electronic Delivery Systems bill before the South African Parliament. OA is also a member of the WHO Tobacco Regulation Study Group (TobReg) and a co-lead of the Product standards subcommittee of the SRNT's Policy and Regulatory Science Network.

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Past President of the Society for Research on Nicotine & Tobacco and a Member of the Expert Working Group on Tobacco, Health Coalition Aotearoa, a member of the Scientific Advisory Committee of the RESPIRE research programme, University of Edinburgh; and a member of the CREATE Tobacco Endgame Centre of Research Excellence, Australia. CB carried out independent consultancy for Johnson & Johnson in 2020 on NRT, and Kenvue Inc. for an ASEAN regional smoking cessation network in 2023 and 2024.

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