



Deposited via The University of York.

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/id/eprint/244585/>

Version: Accepted Version

---

**Article:**

Shelley, Donna, Rigotti, Nancy A, Murthy, Pratima et al. (2026) Evidence-Based Tobacco Cessation Treatment for Low- and Middle-Income Countries. *New England Journal of Medicine*. pp. 684-693. ISSN: 1533-4406

<https://doi.org/10.1056/NEJMra2507061>

---

**Reuse**

This article is distributed under the terms of the Creative Commons Attribution (CC BY) licence. This licence allows you to distribute, remix, tweak, and build upon the work, even commercially, as long as you credit the authors for the original work. More information and the full terms of the licence here:

<https://creativecommons.org/licenses/>

**Takedown**

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing [eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk) including the URL of the record and the reason for the withdrawal request.



Please review the Supplemental Files folder to review documents not compiled in the PDF.

## Contextualizing Evidence-Based Tobacco Cessation Treatment for Low- and Middle-Income Countries

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Journal:                      | <i>New England Journal of Medicine</i>                                                                                                                                                                                                                                                                                                                                                                                         |
| Manuscript ID                 | 25-07061.R1                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Article Type:                 | Review Article                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Date Submitted by the Author: | n/a                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Complete List of Authors:     | Shelley, Donna; New York University School of Global Public Health, Public Health Policy and Management<br>Rigotti, Nancy; Massachusetts General Hospital, General Medicine Division<br>Murthy, Pratima; National Institute of Mental Health and Neurosciences Department of Psychiatry, Psychiatry<br>Minh, Hoang; Hanoi University of Public Health, ;<br>Siddiqi, Kamran; University of York, Department of Health Sciences |
| Keywords:                     |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Abstract:                     |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                |

SCHOLARONE™  
Manuscripts

**Contextualizing Evidence-Based Tobacco Cessation Treatment for Low- and Middle-Income Countries**

Donna Shelley, MD<sup>1</sup>, Nancy A. Rigotti, MD<sup>2</sup>, Pratima Murthy<sup>3</sup>, Hoang Van Minh <sup>4</sup>, MD, Kamran Siddiqi, MBBS<sup>5</sup>

<sup>1</sup> School of Global Public Health, New York University, NY, USA  
<sup>2</sup> Tobacco Research & Treatment Center, Department of Medicine, Massachusetts General Hospital, and Harvard Medical School, Boston, MA, USA  
<sup>3</sup> National Institute of Mental Health and Neurosciences, Bangalore, India  
<sup>4</sup> Center for Population Health Sciences, Hanoi University of Public Health, Hanoi, Vietnam  
<sup>5</sup> Hull York Medical School, University of York, York, England

Corresponding author:  
Name: Donna Shelley, MD, MPH  
Email: ds186@nyu.edu

## SUMMARY

Tobacco use is the leading cause of preventable death globally, claiming more than seven million lives each year. The burden of disease is highest in low- and middle-income countries (LMICs) where over 80% of the world's 1.3 billion tobacco users reside. The World Health Organization (WHO) defines six proven strategies to reduce tobacco referred to by the acronym MPOWER. This includes "Offering help to quit". Many LMICs report providing tobacco cessation services, however, only 13 meet the WHO best practice defined as providing both cost-covered behavioral interventions and pharmacotherapy. In this article, case studies from India and Vietnam illustrate how cross-country differences in tobacco-related socio-cultural norms, tobacco use patterns, the tobacco control regulatory environment, industry influence, and health-care system financing shape treatment access and uptake. These cases further demonstrate that cost-effective population-level strategies, including Quitlines, digital interventions, and systemwide screening for tobacco use paired with clinician advice to quit, are essential for expanding treatment reach. Combining these interventions with pharmacotherapy products included on the WHO Model List of Essential Medicines (e.g., cytisine, nicotine replacement therapy) further improves cessation outcomes. System-level models, such as the "Ask about a tobacco use-Advise to quit-Connect to treatment" (AAC), offer a feasible, low-burden pathway for integrating cessation care into routine practice. Ultimately, curbing the rising global burden of tobacco-related disease requires establishing comprehensive cessation support as a universal standard of care, ensuring equitable access for those most affected.

- Over 80% of the world's 1.3 billion tobacco users reside in low-and middle-income countries (LMICs), yet only 13 LMICs meet the WHO best practice defined as providing cost-covered behavioral interventions and pharmacotherapy.

- Population-level strategies, such as Quitlines, digital cessation interventions, systemwide routine screening for tobacco use paired with clinician advice to quit, are cost-effective and essential for expanding treatment reach.
- Prioritizing subsidized access to pharmacotherapies listed on the WHO Model List of Essential Medicines is vital for optimizing treatment access and clinical outcomes.
- System-level models, such as "Ask-Advise-Connect to treatment", offer a feasible approach for integrating cessation care across diverse clinical settings.
- Case studies from India and Vietnam illustrate how contextual differences in tobacco use patterns, social-cultural norms, tobacco regulation and health system financing facilitate or impede access to recommended treatment.
- Curbing the tobacco-related disease burden requires establishing equitable access to comprehensive cessation support as a universal standard of care.

## Introduction

Tobacco use is the leading cause of preventable death globally, killing more than seven million people each year.<sup>1</sup> While global smoking prevalence has declined in recent decades, progress in low-and middle-income countries (LMICs) has been slow due to a combination of continued population growth, gaps in access to tobacco cessation treatment, and tobacco industry interference.<sup>2,3</sup> Over 80% of the world's 1.3 billion tobacco users reside in LMICs.<sup>4</sup> Without accelerating the pace of tobacco control efforts, smoking related deaths will continue to rise, disproportionately impacting LMICs.<sup>5</sup>

In 2003, in response to the globalization of the tobacco epidemic, the World Health Organization (WHO) developed the Framework Convention on Tobacco Control (FCTC), a treaty that outlines cost-effective tobacco control strategies designed to reduce the health and economic burden caused by tobacco use. By 2023, 182 Member States and the European Union, had ratified the FCTC, covering more than 90% of the world population.<sup>6</sup> In 2008, the WHO introduced six evidence-based measures referred to by the acronym MPOWER (**BOX**) to facilitate country-

### **MPOWER Demand-Reduction Measures**

- **Monitor** tobacco use (surveillance)
- **Protect** from tobacco smoke (smoke free air laws)
- **Offer help to quit**
- **Warn** about dangers of tobacco use
- **Enforce** bans on marketing and promotions
- **Raise** tobacco taxes

level implementation of strategies proven to reduce tobacco use and lower smoking prevalence.<sup>1</sup> Offering help to quit is one of the key recommendations. By 2024, however, only 31 countries were providing comprehensive cessation support at the best practice level,<sup>1</sup> including only 28.1% (18/64) of high-income countries, 11.4% (12/105) of middle-income and 3.8% (1/26) of low-income countries.

This article provides an overview of evidence-based interventions for treating tobacco dependence, examines contextual factors that influence implementation of these interventions, and illustrates, through brief country-level studies, strategies for adapting the evidence to align with tobacco control policies, health system characteristics and socioeconomic conditions.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

**Evidence-based tobacco cessation interventions**

There is substantial evidence for safe and cost-effective treatments for tobacco dependence.<sup>7,8</sup> Behavioral and pharmacological treatments are each effective alone to promote smoking abstinence, but combining them further increases abstinence rates. Table 1, adapted from the WHO 2019 MPOWER report, outlines the full range of behavioral and pharmacological options and system-level strategies to facilitate their implementation.<sup>8-13</sup> Digital tobacco cessation interventions promise to expand treatment reach with evidence for effectiveness strongest for text messaging.<sup>8</sup> Although most of this evidence is derived from studies conducted in high-income countries, recent reviews add support for adopting current treatment recommendations in LMICs.<sup>3,14</sup>

For populations at elevated risk of tobacco-related disease, such as those living with HIV, TB, and mental illness, research also supports integrating evidence-based treatment into existing healthcare services to improve health outcomes.<sup>15-19</sup> Finally, patterns of tobacco use (e.g., smokeless, bidis, waterpipe (hookah, sheesha)) differ markedly across regions and countries.<sup>20</sup> Most trials have included people who use cigarettes only, therefore current guidelines do not reflect broader trends in tobacco use, with the exception of smokeless tobacco. Based on moderate-certainty evidence, the 2024 updated WHO treatment guidelines strongly recommend behavioral support and varenicline for people who use smokeless tobacco.<sup>8,21</sup> In the absence of product-specific guidance, all patients should be offered brief advice to quit and referral to intensive behavioral interventions when available.

System and policy-level interventions can facilitate integration of treatment options into existing health care systems, (Table 1)<sup>8</sup> expand access to treatment, and increase treatment uptake. Structured models, such as Ask all patients about tobacco use, Advise users to quit, and proactively Connect to treatment (AAC), helps institutionalize system changes and promotes

1  
2  
3 routine delivery of evidence-based care (Table 2).<sup>7,22</sup> AAC is feasible across diverse health care  
4 settings and effectively engages smokers in treatment while allowing health care workers to  
5 delegate intensive counseling to specialized services.<sup>19,23</sup>  
6  
7  
8  
9

### 10 11 **Contextual factors influencing tobacco cessation**

12 Adoption, implementation, and scale-up of MPOWER policies and tobacco cessation treatment  
13 vary across LMIC regions and countries.<sup>1</sup> These differences are shaped by diverse social and  
14 cultural norms, patterns of tobacco use, healthcare system financing and capacity, industry  
15 influence and competing political, and public health priorities that often lead to underinvestment  
16 in non-communicable disease prevention.<sup>2,24</sup> As a result, many countries lack national  
17 guidelines, monitoring and evaluation systems, adequate health worker training, and  
18 mechanisms to support guideline adherence and documentation. Despite these challenges,  
19 population-level cessation interventions, such as brief clinician advice and Quitlines, available in  
20 39 LMICs, remain highly cost-effective, including in low-resource settings.<sup>25</sup>  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31

32  
33  
34 In countries that have invested in evidence-based tobacco control measures, prevalence has  
35 declined; however, the impact is not consistent across populations.<sup>1</sup> Within countries, tobacco  
36 use is more prevalent among those with lower education, less household wealth, rural residence  
37 and those with comorbid conditions such tuberculosis and HIV infection, mental health and  
38 substance use disorders.<sup>4,26</sup> In some countries, smoking-related stigma, particularly among  
39 women, may also result in underreporting and reluctance to obtain treatment.<sup>27</sup> Continued  
40 tobacco use contributes to sustained poverty among low-income households and growing  
41 disparities in tobacco-related morbidity and mortality.<sup>2</sup>  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51

52  
53  
54 Given the wide variation in global tobacco control contexts, and the range of effective treatment  
55 options available, a one-size-fits-all approach is neither necessary nor desirable. Effective  
56  
57  
58  
59  
60

1  
2  
3 implementation and scale up requires aligning interventions with available resources, including  
4 workforce and health system capacity and infrastructure. For example, the absence of  
5 affordable pharmacotherapy does not preclude health systems from integrating routine  
6 screening, brief advice, and referral to behavioral counseling. Figure 1 shows a WHO-  
7 recommended stepped approach in which more intensive behavioral treatment and  
8 pharmacotherapy are added as resources allow.<sup>9</sup>

15  
16  
17  
18 Importantly, the MPOWER policy measures exert synergistic effects to create an environment  
19 that facilitates tobacco cessation. For example, smoke-free air legislation changes social norms  
20 to encourage cessation and discourage initiation while taxation reduces affordability.<sup>2,28</sup> Within a  
21 comprehensive policy environment, cessation interventions are more likely to achieve sustained  
22 abstinence. To better illustrate these concepts, we present case studies from Vietnam and  
23 India.

24  
25  
26  
27  
28  
29  
30  
31  
32 **Case Studies**

33  
34 The cases are composites informed by the authors' research and the broader literature.  
35 Vietnam and India were selected for their high burden of tobacco use, and cross-country  
36 variation in commonly used tobacco products, determinants of use, and implementation of  
37 WHO-recommended tobacco control policies and cessation services.

38  
39  
40  
41  
42  
43  
44  
45 **Vietnam**

46  
47 *Trần Nam is a 55-year-old male factory worker who has smoked one pack of cigarettes per day*  
48 *for over 35 years and a waterpipe (1-2 times per day) for 18 years. His medical history is also*  
49 *remarkable for a diagnosis of hypertension. He lives in a rural village in Vietnam located north of*  
50 *Hanoi with his wife and two teenage children. He receives health care at his local commune*

1  
2  
3 *health center (CHC) where he sees his physician monthly to track his blood pressure and*  
4 *receive his medication. Most of his friends and coworkers smoke waterpipe and cigarettes.*  
5  
6  
7

8  
9 In Vietnam approximately 16 million people use tobacco (41.1% of men and 1% of women).  
10  
11 The majority smoke cigarettes; 13% of men and less than 1 % of women smoke traditional  
12 bamboo waterpipes (Thuốc Lào).<sup>29-31</sup> Sex differences in tobacco use in Vietnam reflect deeply  
13 embedded cultural norms that construct smoking among men as a marker of masculinity and  
14 social belonging, thereby reinforcing social pressure to smoke in social contexts.<sup>32</sup> In contrast,  
15 tobacco use among women remains highly stigmatized.  
16  
17  
18  
19  
20  
21

22  
23  
24 Vietnam signed the FCTC in 2003 and has implemented a range of MPOWER tobacco control  
25 policies, including smoke free air policies, cigarette pack health warnings, mass media  
26 campaigns, and a tobacco tax. Yet, surveys indicate that between 2010 and 2020, tobacco use  
27 among men declined only 6%, from 47.4% to 41.1%.<sup>29</sup> Declines were greatest among those  
28 with higher incomes and urban residents, widening existing disparities.  
29  
30  
31  
32  
33  
34

35  
36  
37 *Mr. Nam understands the health risks of using cigarettes and has tried to quit smoking but*  
38 *usually relapses within a couple of days. During his visits, his doctor has discussed quitting and*  
39 *asks if he has made any changes since the last visit. He reports that he has stopped smoking at*  
40 *home to protect his wife and children, but his tobacco use outside the home hasn't changed. His*  
41 *job is stressful, and he enjoys smoke breaks at work and relaxing at the end of the day by*  
42 *smoking waterpipe with friends. He remains interested in quitting cigarettes, but he is less*  
43 *motivated to quit using waterpipe because he believes it is less harmful. His doctor emphasizes*  
44 *the harmful health effects of both products, describes the free Quitline service, and strongly*  
45 *recommends he call to speak with a counselor. She also encourages him to use nicotine gum to*  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

*help reduce withdrawal symptoms. He responds, “It is my own will and determination that will help me quit smoking... I don’t think the gum will work.”*

The view that quitting depends solely on willpower is common among men who smoke in Vietnam and creates a barrier to seeking treatment.<sup>32,33</sup> To expand treatment access, in 2015, Vietnam launched a toll-free national Smoker’s Quitline. The service is promoted via national media campaigns and clinician referrals.<sup>34,35</sup> The Quitline also provides a train-the-trainer program for provincial healthcare leaders who train clinicians, primarily in hospitals, where brief advice and counseling protocols have been implemented. Training for clinicians who work in CHCs, the main source of primary care in rural areas, remains limited. A 2020 provincial survey found that a healthcare visit in the past 12 months that included advice to quit, higher education, and health risk awareness significantly correlated with quit attempts among current smokers.<sup>36</sup>

*Prompted by further urging from his wife, Mr. Nam calls the Quitline and completes two calls. He found the counselor encouraging and the recommendations for managing cravings helpful. As a result, he has started to reduce the number of cigarettes he smokes per day, but he does not purchase NRT. He remains convinced that quitting depends on determination alone, and is deterred by the cost of Nicotine gum (50 USD/month; 1,301,000 VND) which would consume 20% of his 247 USD monthly income.*

In Vietnam, health warnings and educational campaigns are raising awareness and shifting cultural norms, discouraging smoking in homes and creating discomfort for smokers as nonsmokers are increasingly willing to express disapproval.<sup>32,37</sup> Over 93% of adults in Vietnam believe smoking causes serious illness.<sup>37</sup> Yet, for men like Mr. Nam, the social benefits of smoking, weak enforcement of smoke-free policies, and limited access to affordable

pharmacotherapy continue to impede cessation. Cessation medication is not covered by national health insurance, and patch, gum and lozenge are the only options available for purchase in retail settings. Additionally, in the context of rapidly rising incomes, cigarettes remain highly affordable (~0.40 USD per pack for domestic brands).<sup>38,39</sup> This is owing to tobacco taxes that fall below WHO-recommended levels and conflicts of interest associated with the state-owned Vietnam National Tobacco Corporation which influence tax policy.<sup>40</sup> Together, these environmental, social, and economic conditions make it difficult for smokers who wish to quit to sustain abstinence.

*At his next monthly visit, Mr. Nam's physician congratulates him on reducing his use of tobacco as meaningful progress. She encourages continued engagement with the Quitline to obtain expert guidance, and suggests seeking support from friends and colleagues to reduce social pressure.*

## India

*Priya Bala, a 31-year-old woman, has been using khaini, a smokeless tobacco product, for over 16 years. Several times a day, she parks khaini between her gums and cheeks, often leaving it overnight in her mouth. She lives with her husband and two children in a village in Odisha, India. Since first trying khaini when she was sent to buy it for her grandmother from the local grocery, she has continued to use it alone and with friends. Her husband does not use smokeless tobacco, but he smokes bidis.*

India is home to over 251 million adults who use tobacco. A fifth (53 million) of these are women.<sup>4</sup> Since signing the FCTC in 2004, India has implemented the full range of MPOWER policies including mass media campaigns, measures to curb tobacco advertising and promotion, smoke free air policies, health warnings on over 85% of tobacco packaging, including

smokeless tobacco products, a national Quitline and text messaging program, and free access to NRT.

Smokeless tobacco is the predominant form of tobacco used in India with 25.1% people (males=18.2% & females=11.1%) consuming it on a daily basis.<sup>41</sup> With sociocultural norms playing a significant role in smokeless tobacco use, there are wide local geographical variations in its use. A wide variety of smokeless tobacco products are available; including betel quid with tobacco, *khaini gul*, *gutka*, *mawa*, *mishri*, *pan masala* with tobacco, and *zarda*. These products can be chewed, sucked, or tucked between the teeth and cheeks or lips.<sup>42</sup> *Khaini* is one such product, designed for oral use.<sup>43</sup> *Khaini* has high levels of free nicotine and tobacco specific nitrosamines. Like many other smokeless tobacco products, it is highly addictive and is causally associated with oral cancer.<sup>44</sup>

*As a homemaker, Mrs. Bala bears many domestic responsibilities, and when stressed, uses khaini more frequently. She is currently pregnant and struggling with morning sickness. She tried khaini as a remedy for this. She was recently visited by an ASHA (Accredited Social Health Activist) community health worker (CHW). In addition to regular pregnancy checks, the ASHA worker encouraged her to quit khaini, explaining its potential harm to the baby, and her increased risk of oral cancer. She was motivated, but failed to quit, as the urges were too strong.*

Smokeless tobacco use is an addictive behavior, deeply rooted in social contexts in India. Influenced by easy access, cultural norms and peer pressure, most women in India who use smokeless tobacco initiate use in adolescence.<sup>45</sup> Many continue it during adulthood to cope with stress, family responsibilities, and hard domestic duties.<sup>45</sup> However, the social norms are shifting towards discouraging smokeless tobacco use. In a study in India, many women reported

1  
2  
3 receiving advice on the harms of smokeless tobacco use from ASHA workers, which resulted in  
4 a quit attempt.<sup>46</sup> An analysis of two national surveys highlighted that brief advice from a health  
5 care professional is a strong predictor of quit attempts among tobacco users.<sup>47</sup> However, many  
6 barriers to quitting smokeless tobacco remain. In Indian society, smokeless tobacco use is  
7 considered less harmful, socially acceptable, and does not carry the same level of stigma as  
8 smoking.<sup>48</sup> Smokeless tobacco is cheap, and the taxes levied on it are far less than those on  
9 smoked products.<sup>49</sup>

10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20 *Mrs. Bala gave birth to her third child uneventfully. A few months later, she developed a painful*  
21 *ulcer in her mouth. She waited for a week, but the pain got worse. She went to the local primary*  
22 *care center where she was advised to visit a nearby hospital. The doctor who examined her,*  
23 *took a biopsy, asked her to come back in two weeks, and recommended that she visit the*  
24 *tobacco cessation center located in the same hospital. She was scared that she might have*  
25 *developed mouth cancer, so she made an appointment. At the center, she was offered advice*  
26 *on how to set a quit date, manage withdrawal symptoms and avoid triggers that prompt Khaini*  
27 *use, and given nicotine gum. In a couple of weeks, she was relieved to find that her mouth ulcer*  
28 *was not cancer and would resolve if she quit khaini. This motivated her to start the gum and to*  
29 *continue to seek help to remain abstinent.*

30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43 In India, factors that motivate quit attempts among women who use smokeless tobacco include  
44 detection of oral lesions and family pressure, especially during pregnancy.<sup>46</sup> India has 500  
45 national tobacco cessation centres across the country.<sup>50,51</sup> However, the service faces many  
46 hurdles, including inadequate human resources, and funding gaps, and suboptimal enforcement  
47 of existing tobacco control legislation.<sup>51</sup> The Ministry of Health and Family Welfare established  
48 National Tobacco Quitline Services in May 2016. Run by four national Centers, the Quitlines  
49 operate through a toll-free number. Although they help thousands of people to quit every year,  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

less than 2% of woman who use tobacco utilize this service.<sup>52,53</sup> India’s free short text message (SMS) based mHealth cessation program is accessed through a toll-free number and sends SMS messages to the caller’s registered mobile number. Based on self-reported 4-week abstinence, one in five users have managed to quit.<sup>54</sup> Unfortunately, awareness of this service is still very low.<sup>55</sup>

*At her follow up visit, Mrs. Bala remains abstinent but reports stress-induced cravings. The counselor provides stress-management strategies and craving tips, encourages her to use the NRT, and refers her to the Quitline for additional support.*

**Conclusion**

The cases highlight contextual determinants of treatment access, such as tobacco control policies and investments in health system infrastructure, that are relevant across all WHO regions. They further demonstrate that cost-effective population-level interventions, including Quitlines, digital interventions, and systemwide screening paired with clinician advice to quit, are essential to expand treatment reach. Combining these behavioral interventions with pharmacotherapy products that are including on the WHO Model List of Essential Medicines, further improves clinical outcomes.<sup>8</sup> Notably, India’s model of expanding CHW roles to include cessation support further strengthens health system capacity to deliver evidence-based treatment. Studies conducted in LMICs have shown that CHW–delivered counseling, when paired with brief clinician advice, yields significantly higher quit rates than brief advice alone.<sup>56-58</sup>

Both patients demonstrated a willingness to engage in treatment. Mr. Nam’s reduction in cigarette use reflects an early but clinically meaningful step toward smoking abstinence. Given the chronic, relapsing nature of tobacco dependence, most smokers require multiple quit attempts before achieving long-term abstinence.<sup>59</sup> Viewed through this lens, every clinic

1  
2  
3 encounter is an opportunity for clinicians and CHWs to reinforce goals, repeat offers to connect  
4 patients to pharmacotherapy and behavioral treatment, and arrange follow up to sustain  
5 progress. Scaling this approach requires investments in health care worker training to increase  
6 confidence and skills and shift practice norms. Vietnam's train-the trainer program offers an  
7 example of an efficient strategy for scaling capacity-building efforts.  
8  
9  
10  
11  
12

13  
14  
15  
16 The cases also underscore the influence of pharmacotherapy policy on treatment uptake. In  
17 India, point-of-service NRT facilitates a seamless treatment pathway, whereas in Vietnam, out-  
18 of-pocket NRT costs introduce a financial barrier that limits its use. Prioritizing subsidized  
19 access to pharmacotherapy is vital for optimizing treatment access and clinical outcomes.<sup>8,60</sup>  
20  
21 LMICs are making meaningful progress in implementing population-and system-level cessation  
22 strategies that promote treatment engagement. Yet, regional disparities in tobacco-related  
23 outcomes persist. Curbing the growing tobacco-related disease burden requires establishing  
24 equitable access to comprehensive cessation support as a universal standard of care.  
25  
26  
27  
28  
29  
30  
31

32  
33  
34  
35 **Conflict of Interest:** Dr. Rigotti has received research grants from Achieve Life Sciences for an  
36 investigational smoking cessation medication. The other authors declare no conflict of interest.  
37  
38  
39  
40

41 **Ethical approval:** Not applicable.  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

References

1. World Health Organization. *WHO report on the global tobacco epidemic, 2025: warning about the dangers of tobacco*. 2025.

2. McHardy J, Marquizo AB, Bettcher D, Gakidou E. Policy view: worldwide patterns of tobacco use with recommendations for tobacco control. *Lancet Respir Med*. 2025;13(8):756-768.

3. Shankar A, Parascandola M, Sakthivel P, Kaur J, Saini D, Jayaraj NP. Advancing tobacco cessation in LMICs. *Curr Oncol*. 2022;29(12):9117-9124.

4. World Health Organization. *WHO global report on trends in prevalence of tobacco use 2000-2024 and projections 2025-2030*. 2025.

5. Chen Q, Zhang C, Zhong F, Huang Y, Zeng Y, Zhang S. Global burden of disease related to tobacco products and trends projected: 1990–2021. *Addict Behav*. 2025;169:108391.

6. World Health Organization. *Global Progress Report on Implementation of the WHO Framework Convention on Tobacco Control*. 2024.  
<https://fctc.who.int/resources/publications/m/item/2023-global-progress-report>

7. Krist AH, Davidson KW, Mangione CM, et al. Interventions for tobacco smoking cessation in adults, including pregnant persons: US Preventive Services Task Force recommendation statement. *JAMA*. 2021;325(3):265-279.

8. World Health Organization. *WHO clinical treatment guideline for tobacco cessation in adults*. World Health Organization; 2024.

9. World Health Organization. *WHO report on the global tobacco epidemic 2019: offer help to quit tobacco use*. 2019.

10. World Health Organization. *The selection and use of essential medicines: report of the WHO Expert Committee on Selection and Use of Essential Medicines, 2025*. 2025.  
<https://doi.org/10.2471/B09544>

11. Reddy KP, Paltiel AD, Freedberg KA, Rigotti NA. Public Health Impact of FDA's Request for Additional Safety Data on Cytisine for Tobacco Cessation. American Medical Association; 2024:e242647-e242647.
12. Rigotti NA. Electronic cigarettes for smoking cessation—have we reached a tipping point. *N Engl J Med*. 2024;390(7):664-665.
13. Lindson N, Livingstone-Banks J, Butler AR, et al. Electronic cigarettes for smoking cessation. *Cochrane Database Syst Rev*. 2025;(11)doi:10.1002/14651858.CD010216.pub10
14. Akanbi MO, Carroll AJ, Achenbach C, et al. The efficacy of smoking cessation interventions in low-and middle-income countries: a systematic review and meta-analysis. *Addiction*. 2019;114(4):620-635.
15. Elsey H, Al Azdi Z, Regmi S, et al. Scaling up tobacco cessation within TB programmes: findings from a multi-country, mixed-methods implementation study. *Health Res Policy Syst*. 2022;20(1):43.
16. Shuter J, Goel S, Himelhoch SS. Integration of Tobacco-Cessation Interventions into Tuberculosis and HIV Care. *N Engl J Med*. 2025;0(0)doi:10.1056/NEJMp2500490
17. Taylor GM, Lindson N, Farley A, et al. Smoking cessation for improving mental health. *Cochrane Database Syst Rev*. 2021;3(3):CD013522. doi:10.1002/14651858.CD013522.pub2
18. 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*. May 7 2013;158(9):667-75. doi:10.7326/0003-4819-158-9-201305070-00006
19. Shelley D, Armstrong-Hough M, Alvarez Guevara G, et al. Effectiveness of behavioural tobacco cessation interventions with and without pharmacotherapy among people living with HIV in Vietnam: a randomised controlled trial. *Lancet Glob Health*. In press;
20. Chen DT, Girvalaki C, Mechili EA, Millett C, Filippidis FT. Global Patterns and Prevalence of Dual and Poly-Tobacco Use: A Systematic Review. *Nicotine Tob Res*. Oct 7 2021;23(11):1816-1820. doi:10.1093/ntr/ntab084

21. Livingstone-Banks J, Vidyasagaran AL, Croucher R, et al. Interventions for smokeless tobacco use cessation. *Cochrane Database Syst Rev*. 2025;(4)doi:10.1002/14651858.CD015314.pub2

22. Vidrine JI, Shete S, Cao Y, et al. Ask-Advise-Connect: a new approach to smoking treatment delivery in health care settings. *JAMA Intern Med*. 2013;173(6):458-464.

23. Shelley D, Cleland CM, Nguyen T, et al. Effectiveness of a multicomponent strategy for implementing guidelines for treating tobacco use in Vietnam Commune Health Centers. *Nicotine Tob Res*. 2022;24(2):196-203.

24. Shelley DR, Kyriakos C, McNeill A, et al. Challenges to implementing the WHO Framework Convention on Tobacco Control guidelines on tobacco cessation treatment: a qualitative analysis. *Addiction*. 2020;115(3):527-533.

25. World Health Organization. *Tackling NCDs: best buys and other recommended interventions for the prevention and control of noncommunicable diseases*. World Health Organization; 2024.

26. Theilmann M, Lemp JM, Winkler V, et al. Patterns of tobacco use in low and middle income countries by tobacco product and sociodemographic characteristics: nationally representative survey data from 82 countries. *Bmj*. Aug 30 2022;378:e067582. doi:10.1136/bmj-2021-067582

27. David JC, Fonte D, Sutter-Dallay AL, et al. The stigma of smoking among women: A systematic review. *Soc Sci Med*. 2024;340:116491. doi:10.1016/j.socscimed.2023.116491

28. Ngo A, Cheng K-W, Chaloupka FJ, Shang C. The effect of MPOWER scores on cigarette smoking prevalence and consumption. *Prev Med*. 2017;105:S10-S14.

29. Vu LTH, Bui QTT, Shelley D, et al. Temporal Trends in Tobacco Smoking Prevalence During the Period 2010–2020 in Vietnam: A Repeated Cross-Sectional Study. *Int J Public Health*. 2024;69:1607104.

30. Xuan LTT, Van Minh H, Giang KB, Nga PTQ, Hai PT, Minh NT. Prevalence of Waterpipe Tobacco Smoking Among Population Aged 15 Years or Older, Vietnam, 2010. *Preventing Chronic Disease*. 2013;10:E57. doi:10.5888/pcd10.120100
31. Morton J, Song Y, Fouad H, et al. Cross-country comparison of waterpipe use: nationally representative data from 13 low and middle-income countries from the Global Adult Tobacco Survey (GATS). *Tob Control*. Sep 2014;23(5):419-27. doi:10.1136/tobaccocontrol-2012-050841
32. Nguyen TNP, Vu TT, Love J, Ng N, Van Hoang M, Hunsberger M. Tobacco control policies in Vietnam: a qualitative analysis of the experiences of men who smoke. *Tob Control*. 2025;tc-2024-059255:Online ahead of print. doi:10.1136/tc-2024-059255
33. Shelley D, Alvarez GG, Nguyen T, et al. Adapting a tobacco cessation treatment intervention and implementation strategies to enhance implementation effectiveness and clinical outcomes in the context of HIV care in Vietnam: a case study. *Implement Sci Commun*. 2022;3(1):112.
34. Ngo CQ, Phan PT, Vu GV, et al. Impact of a smoking cessation quitline in Vietnam: evidence base and future directions. *Int J Environ Res Public Health*. 2019;16(14):2538.
35. Huang W-C, Marks GB, Pham NY, et al. A smoking quitline integrated with clinician counselling at outpatient health facilities in Vietnam: a single-arm prospective cohort study. *BMC Public Health*. 2022;22(1):739. doi:10.1186/s12889-022-13203-y
36. Luu NM, Tran TTH, Luong NK, et al. Smoking cessation, quit attempts and predictive factors among Vietnamese adults in 2020. *Asian Pac J Cancer Prev*. 2023;24(5):1701.
37. Minh An DT, Van Minh H, Huong LT, et al. Knowledge of the health consequences of tobacco smoking: a cross-sectional survey of Vietnamese adults. *Glob Health Action*. 2013;6(1):18707.
38. Tran TPT, Nguyen TNP, Vu TT, et al. Changes in retail cigarette price after tax increase: Findings from the 2018-2020 ITC Vietnam surveys. *Tob Induc Dis*. 2024;22doi:10.18332/tid/196675

39. Nguyen C, Le T, Nguyen N. The impact of cigarette prices on smoking participation and tobacco expenditure in Vietnam. *PLoS One*. 2021;16(12):e0260415.  
doi:10.1371/journal.pone.0260415

40. Reyes I. *ASEAN Tobacco Industry Interference Index 2023: Implementation of Article 5.3 of the WHO Framework Convention on Tobacco Control*. 2023.  
<https://exposetobacco.org/resources/2023-asia-regional-tii-index/>

41. World Health Organization, Centers for Disease Control and Prevention, Ministry of Health and Family Welfare (India). *GATS 2: Global Adult Tobacco Survey Fact Sheet, India 2016–2017*. 2019. [https://assets.tobaccofreekids.org/global/pdfs/en/GATS\\_India\\_2016-17\\_FactSheet.pdf](https://assets.tobaccofreekids.org/global/pdfs/en/GATS_India_2016-17_FactSheet.pdf)

42. Sharma P, Cheah NP, Kaur J, et al. Physical and chemical characterization of smokeless tobacco products in India. *Sci Rep*. 2023;13(1):8901.

43. AddictO Vocab. Khaini. Accessed February 16, 2025, [https://addictovocab.org/ADDICTO\\_0000972](https://addictovocab.org/ADDICTO_0000972)

44. Rumgay H, Nethan ST, Shah R, et al. Global burden of oral cancer in 2022 attributable to smokeless tobacco and areca nut consumption: a population attributable fraction analysis. *Lancet Oncol*. 2024;25(11):1413-1423.

45. Kerketta AS, Panda A, Parida J, et al. Patterns and influencing factors of smokeless tobacco use among pregnant and lactating mothers in urban slums of bhubaneswar, Odisha. *Sci Rep*. 2025;15(1):30242.

46. Sharma R, Ganjiwale J, Kanaan M, Flemming K, Siddiqi K. How do family members influence smokeless tobacco consumption during pregnancy in India? Perspectives of pregnant women. *PLOS Glob Public Health*. 2024;4(6):e0002828.

47. Al-Ssabbagh M, Elango V, Winkler V. What makes people quit tobacco and succeed at it? An exploratory analysis of smoked and smokeless tobacco from India. *Prev Med*. 2022;158:107033.

48. Sequeira M, Naughton F, Velleman R, et al. Perspectives of smokers, smokeless tobacco users and cessation practitioners in India: A qualitative study. *Arch Psychiatr Nurs*. 2024;51:194-200.
49. John RM, Yadav A, Sinha DN. Smokeless tobacco taxation: lessons from Southeast Asia. *Indian J Med Res*. 2018;148(1):46-55.
50. Varghese C, Kaur J, Desai NG, et al. Initiating tobacco cessation services in India: challenges and opportunities. *WHO South East Asia J Public Health*. 2012;1(2):159-168.
51. Gupta R, Aghi MB, Gupta A, Bhatt G, Goel S. Strategic initiatives to improve tobacco cessation delivery in India. *Indian J Community Med*. 2022;47(3):328-331.
52. Kumar R, Kumar M, Raj S, et al. Quitting tobacco through quitline services: impact in India. *Monaldi Arch Chest Dis*. 2024;95(3):Epub. doi:10.4081/monaldi.2024.2976
53. Budukh A, Mhamane S, Bagal S, et al. Factors influencing tobacco quitting: findings from National Tobacco-Quitline Services, Mumbai, India. *ecancermedicalscience*. 2024;18:1777.
54. Gopinathan P, Kaur J, Joshi S, et al. Self-reported quit rates and quit attempts among subscribers of a mobile text messaging-based tobacco cessation programme in India. *BMJ Innov*. 2018;4(4):147-154.
55. Basu S, Yadav P, Banerjee B, Yadav A. The effect of a clinic-based behavioral intervention in promoting enrolment in a text-message tobacco cessation program at a rural primary health clinic in Delhi, India. *Tob Prev Cessat*. 2020;6:27. doi:10.18332/tpc/120382
56. Jeet G, Thakur JS, Prinja S, Singh M. Community health workers for non-communicable diseases prevention and control in developing countries: Evidence and implications. *PLoS One*. 2017;12(7):e0180640. doi:10.1371/journal.pone.0180640
57. Zulkipli SH, Ramli LF, Fisal ZAM, Tabassum B, Abdul Manaf R. Effectiveness of community health workers involvement in smoking cessation programme: A systematic review. *PLoS One*. 2020;15(11):e0242691. doi:10.1371/journal.pone.0242691

58. Hejjaji V, Khetan A, Hughes JW, et al. A combined community health worker and text messagingbased intervention for smoking cessation in India: Project MUKTI - A mixed methods study. *Tob Prev Cessat*. 2021;7:23. doi:10.18332/tpc/132469

59. U.S. Department of Health and Human Services. *Smoking cessation: a report of the Surgeon General*. 2020. <https://www.hhs.gov/sites/default/files/2020-cessation-sgr-full-report.pdf>

60. Rigotti NA, Walker N, Amer Nordin AS. Integrating Pharmacotherapy into Tobacco Control in Low- and Middle-Income Countries - A Critical Need. *N Engl J Med*. Sep 18 2025;393(11):1041-1044. doi:10.1056/NEJMp2500685

**Table 1.** Tobacco cessation behavioral, pharmacotherapy, system and policy level interventions.<sup>9</sup>

|                                                     |                                                     |                              |                                                                                                                                                                                                                      |
|-----------------------------------------------------|-----------------------------------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Behavioral interventions</b>                     | <b>Population-level approaches</b>                  | <b>Brief advice</b>          | 30 seconds to 3 minutes delivered by health care provider during routine visits                                                                                                                                      |
|                                                     |                                                     | <b>Quitlines</b>             | National toll-free telephone counseling service                                                                                                                                                                      |
|                                                     |                                                     | <b>m-Cessation</b>           | Text message interventions, mobile applications                                                                                                                                                                      |
|                                                     | <b>Individual specialist approaches</b>             | <b>Individual specialist</b> | Multiple sessions of individual or group counselling, provides support and resources to develop skills and strategies for changing behavior.                                                                         |
|                                                     |                                                     | <b>Cessation clinics</b>     | In some countries clinics offer intensive behavioral support                                                                                                                                                         |
| <b>Pharmacotherapy</b>                              | <b>*Nicotine replacement Therapy (NRT)</b>          |                              | <u>Long acting:</u> Nicotine patch<br><u>Short acting:</u> Nicotine gum, lozenge, inhaler, spray                                                                                                                     |
|                                                     | <b>**Non-nicotine pharmacotherapy</b>               |                              | Varenicline, bupropion and cytisine                                                                                                                                                                                  |
| <b>System level interventions and policy change</b> | <b>Train all health care workers</b>                |                              | <ul style="list-style-type: none"> <li>• Train health care workers (MD, nurse, community health workers) on brief advice, behavioral support and medications</li> <li>• Define roles and responsibilities</li> </ul> |
|                                                     | <b>Implement screening and documentation system</b> |                              | Include tobacco use status in medical records                                                                                                                                                                        |
|                                                     | <b>Implement Quitline referral system</b>           |                              | Integrate proactive referral systems to link patients to Quitline or other behavioral interventions                                                                                                                  |
|                                                     | <b>Monitor performance</b>                          |                              | Track compliance with treatment policy                                                                                                                                                                               |
|                                                     | <b>Reduce or eliminate costs</b>                    |                              | <ul style="list-style-type: none"> <li>• Provide cost coverage</li> <li>• Offer financial incentives, such as cash payments, or vouchers</li> </ul>                                                                  |

\*The combination of long and short acting NRT can increase the effectiveness compared with either form of NRT alone.

\*\*Varenicline and bupropion are licensed in many countries. Cytisine, a low-cost medication whose mechanism of action resembles varenicline, is less widely available but was added to the WHO Model List of Essential Medicines in 2025.<sup>10,11</sup> The 2024 WHO treatment guidelines do not include alternative nicotine delivery systems. Of these products, e-cigarettes (including vaping devices) have the strongest evidence from RCTs of efficacy to aid tobacco cessation and reduce health harms compared to continued smoking. Several countries include ENDS in national treatment guidelines.<sup>12,13</sup>

**Table 2.** Ask, Advise, Connect to Care Model

|                |                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ask</b>     | Ask every patient about tobacco use during clinic visits.                                                                                                                                                                                         | <i>Do you currently use any tobacco products, including smoked cigarettes, waterpipe/hookah, bidis or smokeless forms like chewing tobacco, snus, betel quid with tobacco? “Do you use electronic cigarettes or a heated tobacco product?”</i>                                                                                                                                                                                                                                                                                                      |
| <b>Advise</b>  | Deliver clear advice to stop using tobacco. Focus on the benefits of quitting and the support available. Personalize advice and tailor to patient’s risk factors and patterns of tobacco use.                                                     | <i>“Quitting is challenging but it is the most important thing you can do to protect your health and live longer. Quitting will also protect the people around you from the dangers of secondhand smoke. Quitting will also save you money. There are medications and programs that can help.”</i><br><br><i>“Would you like to hear about treatment options to help you quit or make a plan to cut down on your tobacco use?”</i>                                                                                                                  |
| <b>Connect</b> | If ready to quit, provide information about pharmacotherapy, and behavioral programs.<br><br>Prescribe medication and connect the patient directly behavioral therapy (e.g., with patient consent, connect them to the Quitline during the visit) | <b>Not ready to quit:</b><br><i>“I understand that quitting can be hard, but I am here to support you. I will ask you about it again the next time I see you.”</i><br><br><b>Ready to quit:</b> <i>“There are several medications that can help you quit by reducing cravings and withdrawal symptoms. Counseling can also help you create a plan.” (Depending on resources, prescribe or recommend OTC medication, provide instructions on how to use the medication and proactively refer patients to national or local behavioral programs.)</i> |

**Figure 1.** Minimal, expanded and advanced cessation interventions (adapted from WHO 2019 report).<sup>9</sup>

| STEP 1: MINIMAL                                                         | STEP 2: EXPANDED                                                                                               | STEP 3: ADVANCED                                                                     |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Screening and brief advice</b> integrated into primary care services | <b>Brief advice</b> integrated into primary care, hospital and specialized outpatient services (e.g., HIV, TB) | <b>Brief advice</b> integrated into primary care, hospital and specialized services  |
|                                                                         | <b>Establish Quitline and/or Digital Cessation</b> (text, mobile app) <b>service</b>                           | <b>Establish Quitline and/or Digital Cessation</b> (text, mobile app) <b>service</b> |
|                                                                         |                                                                                                                | <b>Cost covered NRT or at least one cost covered cessation service</b>               |
|                                                                         |                                                                                                                | <b>Specialized tobacco dependence treatment services.</b>                            |