



# HHS Public Access

Author manuscript

*Int J Tuberc Lung Dis.* Author manuscript; available in PMC 2016 February 12.

Published in final edited form as:

*Int J Tuberc Lung Dis.* 2015 September ; 19(9): 1003–1006. doi:10.5588/ijtld.14.0813.

## Clearing the smoke around the TB-HIV syndemic: smoking as a critical issue for TB and HIV treatment and care

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### SUMMARY

The collision of the tuberculosis (TB) and human immunodeficiency virus (HIV) epidemics has been described as a ‘syndemic’ due to the synergistic impact on the burden of both diseases. This paper explains the urgent need for practitioners and policy makers to address a third epidemic that exacerbates TB, HIV and TB-HIV. Tobacco use is the leading cause of preventable death worldwide. Smoking is more prevalent among persons diagnosed with TB or HIV. Smoking is associated with tuberculous infection, TB disease and poorer anti-tuberculosis treatment outcomes. It is also associated with an increased risk of smoking-related diseases among people living with HIV, and smoking may also inhibit the effectiveness of life-saving ART. In this paper, we propose integrating into TB and HIV programmes evidence-based strategies from the ‘MPOWER’ package recommended by the World Health Organization’s Framework Convention on Tobacco Control. Specific actions that can be readily incorporated into current practice are recommended to improve TB and HIV outcomes and care, and reduce the unnecessary burden of death and disease due to smoking.

### Keywords

tuberculosis; HIV; tobacco; smoking; public health

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The collision of the human immunodeficiency virus (HIV) and tuberculosis (TB) epidemics has been described as a syndemic due to the synergistic impact on the burden of disease.<sup>1</sup> People living with HIV (PLHIV) are more likely to progress from tuberculous infection to TB disease,<sup>2</sup> and TB remains the leading cause of death among PLHIV.<sup>3</sup> The global scale-up of both antiretroviral therapy (ART) for PLHIV and the collaborative TB-HIV activities recommended by the World Health Organization (WHO) have contributed to a 36% decline

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Conflicts of interest: none declared.

in TB deaths among PLHIV between 2004 and 2012.<sup>4</sup> Although TB and HIV are leading causes of death due to infection, tobacco use remains the overall leading cause of death worldwide. Separate guidelines on how to address smoking among TB or HIV patients by the WHO and other organisations exist; however, these do not highlight the critical linkages between TB, HIV and smoking. This Perspective underlines the urgent need to adopt a synergistic approach and identifies how recommended measures of tobacco control can also be applied effectively in TB and HIV practice.

## IMPACT OF TOBACCO USE ON PERSONS WITH TB, HIV AND TB-HIV

Taking lessons learned from the TB-HIV collaboration, there is growing recognition of the need to address other health conditions and risk factors that exacerbate the global burden of TB<sup>5,6</sup> or HIV.<sup>7</sup> Tobacco use is the leading preventable cause of death globally,<sup>8</sup> and smoking negatively affects efforts to prevent and treat TB and HIV infection. Smoking is associated with tuberculous infection, TB disease and poor anti-tuberculosis treatment outcomes (i.e., recurrent disease and mortality).<sup>9,10</sup> An estimated 16% of all TB cases could be prevented if smoking and exposure to secondhand smoke (SHS) were eliminated.<sup>5</sup>

Based on limited available data, the observed prevalence of smoking among TB patients has been reported to be double or only slightly greater than the prevalence in the general population, depending on the setting.<sup>11-14</sup> Of note, both reported cases of TB<sup>15</sup> and the prevalence of smoking<sup>16</sup> are higher among men than women in most countries.

PLHIV who smoke suffer disproportionately from non-communicable diseases (NCDs) compared to non-smoking PLHIV. Compared to PLHIV who do not, PLHIV who smoke have an increased risk of developing lung and other forms of cancer, are more likely to develop bacterial pneumonia, *Pneumocystis jiroveci* pneumonia (PJP), chronic obstructive pulmonary disease (COPD), heart disease, thrush or oral hairy leukoplakia,<sup>17,18</sup> have a greater rate of progression from HIV infection to AIDS and have a poorer response to life-saving ART.<sup>19,20</sup> Based on available data, smoking prevalence among PLHIV exceeds that in the general population.<sup>11,18,21-23</sup>

TB and HIV treatment requires multiple interactions with the health system. The repeated visits provide health care workers with ample opportunity for the screening, diagnosis and management of NCDs and behavioural risk factors, such as tobacco use. In the present paper, we propose expanding the scope of TB-HIV collaborative activities to include the assessment, followed by the implementation, of evidence-based strategies to prevent or promote cessation of tobacco use among TB, HIV and TB-HIV patients (hereafter, TB-HIV refers to patients with TB, HIV or TB and HIV).

## APPLYING 'MPOWER' EVIDENCE-BASED INTERVENTIONS TO TB AND HIV PRACTICE

The evidence-based 'MPOWER' package was developed by the WHO to catalyse global efforts to address the tobacco epidemic. 'MPOWER' includes the following six key recommendations: 'Monitor', 'Protect', 'Offer', 'Warn', 'Enforce' and 'Raise'.<sup>24</sup> Between

2007 and 2010, the implementation of ‘MPOWER’ resulted in an estimated 14.8 million fewer smokers, averting a total of 7.4 million deaths attributable to smoking.<sup>25</sup> By encouraging TB and HIV practitioners and programmes to address tobacco use, we can extend the implementation of ‘MPOWER’ measures and thereby reduce tobacco-related morbidity and mortality among TB-HIV patients and potentially improve anti-tuberculosis treatment and HIV therapeutic outcomes.

Practical ways in which TB and HIV practitioners can engage in interventions that are feasible and relevant to routine care are discussed, focusing on ‘MPOW’ for individual practitioners and ‘E’ for programme and institution managers. ‘R’—Raise tobacco taxes—is a high-impact strategy that requires actions beyond the direct control of individual practitioners.

### **Monitor**

Data on tobacco use, cessation and exposure to SHS are needed to guide the development of interventions for TB-HIV patients at individual, community and population levels. ‘Tobacco Questions for Surveys’ (TQS) are rigorously pre-tested questions that can be inserted into existing TB and HIV recording and reporting forms, prevalence and drug resistance surveys, and other routine data collection systems.<sup>26</sup> The assessment and recording of individual patient smoking status as part of standard care is also essential for effective counselling and support. Accurate assessment is important and may require revised questions or cotinine testing to address under-reporting due to recent or ‘temporary’ quitters as a result of TB-induced coughing.

### **Protect**

There is no safe level of exposure to SHS, which contributes to a range of serious diseases, including cardiovascular disease and lung cancer.<sup>27–29</sup> Smokefree health care environments have been identified as a key strategy for institutions and practitioners to protect patients, staff and visitors.<sup>30,31</sup> Implementing smokefree environments should be part of routine infection control duties of TB-HIV staff. Staff can post ‘no smoking’ signs, and all staff should be responsible for providing information to patients and families and enforcing policy. To assist implementation, trained staff can provide brief support to patients and families to help them quit smoking, as described below.

Staff from TB and HIV programmes can advise patients and their families on how to make their homes smoke free and eliminate SHS exposure. This protects against the general adverse impacts of SHS on health,<sup>32,33</sup> and especially protects TB-HIV patients who have heightened vulnerability. Smokefree homes can also support cessation by reducing smoking cues,<sup>34</sup> and this may assist TB-HIV patients to quit. Brief counselling and provision of information, education and communication (IEC) materials can also be effective,<sup>35</sup> and can be successfully incorporated into clinical encounters<sup>36,14,37</sup> and practitioner home visits.<sup>35</sup>

### **Offer**

Quitting produces immediate and long-term health benefits.<sup>38</sup> The most effective interventions developed and tested for the general population include brief advice to quit and

guidance about available support, one-to-one or group counselling, and provision of pharmacotherapy.<sup>39</sup> In countries where pharmacotherapy is not included on the essential drug formularies, brief advice and counselling alone can be effective.<sup>40,41</sup> Behavioural support has been shown to be generally effective in low- and middle-income countries;<sup>42</sup> the ‘ASSIST’ trial found that behavioural support, with or without bupropion, is effective in promoting cessation among smokers with suspected TB.<sup>36</sup> Dogar and Siddiqi provide an overview of evidence-based models of behavioural support that may be adapted for local use.<sup>43</sup> Data on cessation of tobacco use among TB-HIV patients are limited; however, available trial evidence indicates that the standard recommended interventions are feasible,<sup>44</sup> and can be effective.<sup>45</sup> Advice and counselling should be tailored to the needs of TB-HIV patients, while pharmacotherapy options should be evaluated by clinicians to ensure compatibility with anti-tuberculosis and/or ART treatment regimens.

### **Warn**

Specific information for people with tuberculous infection, TB disease and/or HIV and their families about the link between tobacco use and TB and the potential for reducing the effectiveness of ART is crucial and may have the greatest resonance. Practitioners are advised to use all available channels to educate and inform people about tobacco risks.<sup>24</sup>

### **Enforce**

Institution and programme managers can help protect TB-HIV patients by enacting their own regulations to ban the institution and staff from undertaking or accepting tobacco promotions or sponsorship.<sup>8</sup>

## **A SIGNIFICANT PUBLIC HEALTH OPPORTUNITY**

Failure to address smoking among men, women and children with these conditions may otherwise undermine efforts to improve TB-HIV treatment outcomes. Moreover, the harm caused by tobacco and smoking is preventable.<sup>8</sup> Tobacco control measures should be implemented for TB-HIV patients, their families and communities to tackle a modifiable risk factor that will potentially enhance and extend the quality of people’s lives. Integrating evidence-based ‘M’, ‘P’, ‘O’, ‘W’ and ‘E’ measures into TB and HIV practice requires minimal resource demands. The recommended measures are low cost and can be readily incorporated into day-to-day patient practice; also, they do not require new equipment, complex training or structural changes to health facilities.

For tobacco control practitioners, organisations and governments, the patient encounters inherent in TB-HIV care offer a valuable gateway to address tobacco use. The sheer number of patients constitutes a major public health opportunity. In 2012, an estimated 8.6 million people developed TB, 1.3 million died from the disease (including 320 000 deaths among PLHIV) and there were 35.3 million adults and children living with HIV. The sex and socio-economic profile of TB patients—often affecting more men and the poorer segments of the community—also coincides with groups that generally have a higher prevalence of smoking.<sup>15,16</sup> The successful integration of tobacco control measures into TB-HIV care could provide a model platform from where other risk factors (e.g., substance abuse) and

conditions (e.g., diabetes, COPD, hypertension) might be addressed to improve the overall health of patients.

Collaboration between TB, HIV and tobacco control programmes would afford benefits such as resource sharing, enhanced reach to vulnerable populations and the potential to make logical connections within health systems that will enable more comprehensive patient-centred prevention and care. Guidelines for the treatment of TB and HIV should include recommendations on addressing smoking and other forms of tobacco use. These must go beyond the traditional territory of encouraging cessation and encompass the wider, critically relevant underpinning areas of 'MPOWER'. Screening for tobacco use among people with suspected or diagnosed TB-HIV should be viewed as essential: first, to address the world's leading cause of death, and second, as a component of TB-HIV care to maximise the efficacy of TB-HIV prevention and treatment services.

The colliding epidemiology of TB, HIV and tobacco use provides not only a compelling case for action, but also an important opportunity to address the leading preventable cause of death and to ensure that TB-HIV patients can realise the benefits of anti-tuberculosis treatment, TB preventive therapy and lifesaving ART.

## Acknowledgments

The global tobacco control grants programme, managed jointly by the International Union Against Tuberculosis and Lung Disease (Edinburgh, Scotland, UK) and the Campaign for Tobacco Free Kids (Washington, DC, USA), is funded by the Bloomberg Initiative to Reduce Tobacco Use.

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