REVIEW

Research Priorities for Article 14—Demand Reduction Measures Concerning Tobacco Dependence and Cessation

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ABSTRACT

Introduction: Tobacco dependence treatment (TDT) interventions are often seen as expensive with little impact on the prevalence of tobacco use. However, activities that promote the cessation of tobacco use and support abstinence have an important role in any comprehensive tobacco control program and as such are recognized within Article 14 (A14) of the Framework Convention on Tobacco Control.

Objectives: To review current evidence for TDT and recommend research priorities that will contribute to more people being helped to stop tobacco use.

Methods: We used the recommendations within the A14 guidelines to guide a review of current evidence and best practice for promotion of tobacco cessation and TDT, identify gaps, and propose research priorities.

Results: We identified nine areas for future research (a) understanding current tobacco use and the effect of policy on behavior, (b) promoting cessation of tobacco use, (c) implementation of TDT guidelines, (d) increasing training capacity, (e) enhancing population-based TDT interventions, (f) treatment for different types of tobacco use, (g) supply of low-cost pharmaceutical devices/products, (h) investigation use of nonpharmaceutical devices/products, and (i) refinement of current TDTs. Specific research topics are suggested within each of these areas and recognize the differences needed between high- and low-/middle-income countries.

Conclusions: Research should be prioritized toward examining interventions that (a) promote cessation of tobacco use, (b) assist health care workers provide better help to smokers (e.g., through implementation of guidelines and training), (c) enhance population-based TDT interventions, and (d) assist people to cease the use of other tobacco products.

INTRODUCTION

Place of Treatment in Tobacco Control

There are two fundamental aims of tobacco control programs: (a) to prevent people from starting to use tobacco, and (b) to encourage and assist tobacco users to stop ([World Health Organization, 2008b](#)). Cessation of tobacco use is associated with numerous health benefits, and these benefits are seen across all age groups, ethnicities, and both sexes.

It has been argued that funding for tobacco control should be prioritized for mass media campaigns and other interventions that promote quitting at a population level ([Chapman & MacKenzie, 2010](#)). Although there is little doubt that many people who use tobacco manage to stop unassisted, most could

benefit from treatment ([West et al., 2010](#)). The long-term quit rate associated with unassisted quitting is often quoted between 3% and 5% ([Hughes et al., 1992](#)). A combination of behavioral support and pharmacotherapy can increase abstinence rates fourfold ([USDHHS, 2008](#)). The observation that most ex-tobacco users say that they stopped tobacco use on their own is not because this method is more successful, but simply that most people try to quit in this way ([West et al., 2010](#)).

Goal of Article 14 of the Framework Convention for Tobacco Control

Article 14 of the Framework Convention for Tobacco Control (FCTC) recognizes the role of tobacco dependence treatment (TDT) in comprehensive tobacco control programs ([World](#)

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Health Organization, 2005). It requires Parties to implement effective strategies to promote the cessation of tobacco use and provide evidence-based treatments to assist people in quitting. It sets out general measures that Parties are obliged to adopt, which include the development and dissemination of evidence-based guidelines, activities that promote the cessation of tobacco use, and interventions that assist people to cease tobacco use (see [Box 1](#)).

GOAL OF ARTICLE 14 GUIDELINES

Guidelines for the implementation of Article 14 of the FCTC were developed to guide Parties in meeting their obligations to Article 14 ([WHO Guidelines for Implementation of Article 14 of the WHO Framework Convention on Tobacco Control, 2010](#)) and were adopted at the fourth Conference of the Parties to the FCTC in November 2010 ([Raw, 2011](#)).

The guidelines first outline underlying considerations in treating tobacco dependence and follow with recommendations regarding the (a) development of infrastructure to support tobacco cessation, (b) key components of a system to help tobacco users quit, (c) development of cessation support, and (d) monitoring and evaluation. Many of the underlying considerations and recommendations in the guidelines are relevant to future research needs and so are listed in [Box 2](#) for reference.

What Research Is Needed to Help Countries Implement A14 and Its Guidelines?

We used the Article 14 guidelines recommendations and our collective knowledge of the evidence base for smoking cessation interventions to develop a list of areas where we all agreed that evidence was limited or lacking. All authors have expertise in TDT policy and clinical interventions across many geographic regions, and HM and MR have also cowritten treatment guidelines ([McRobbie, Bullen, et al., 2008](#); [Raw,](#)

[McNeill, & West, 1998](#)). This list was presented to a workshop held before the 13th annual congress of the Society for Research on Nicotine and Tobacco Europe Chapter September 2011. Feedback was collated and incorporated into a revised list. We identified nine areas that are described below and summarized in [Figure 1](#). During the writing and feedback process, it became clear that although some of the research priorities are common to both high-income countries (HICs) and low- and middle-income countries (LMICs), there are some differences. The strongest focus in LMICs should be on monitoring and evaluating interventions that are implemented. However, it is unlikely that LMICs have sufficient funding to both implement and monitor/evaluate, and so international collaboration to assist with both research funding and expertise is crucial. For HICs, especially those in which the rates of decline in smoking prevalence have flattened in recent years, there is a need to investigate how to (a) further increase the rates of people trying to quit, (b) encourage more people to use TDT, and (c) improve the outcomes of TDTs ([Abrams, Graham, Levy, Mabry, & Orleans, 2010](#)). A focus on priority groups (e.g., pregnant women who smoke) and subpopulations with high smoking prevalence (e.g., people with mental illness, people with other drug dependencies, prisoners, and indigenous populations) is also needed ([Lawrence, Mitrou, & Zubrick, 2011](#)).

Before discussing these research priorities, it is important to emphasize that Parties should not wait for research to implement measures for which good evidence already exists. These not only apply to interventions relevant to Article 14, (e.g., brief advice from physicians [[Stead, Bergson, & Lancaster, 2008](#)], telephone quitlines [[Stead, Perera, & Lancaster, 2006](#)], and behavioral support and pharmacotherapy [[USDHHS, 2008](#)]) but to those covered in Articles 6, 8, 11, 12, and 13 of the FCTC ([WHO Guidelines for Implementation of Article 14 of the WHO Framework Convention on Tobacco Control, 2010](#)). To highlight the importance of LMICs implementing interventions with demonstrated effectiveness, we have included these as priorities in [Figure 1](#) and italicized them to distinguish them from the research priorities.

Box 1: Article 14 of the FCTC—Demand reduction measures concerning tobacco dependence and cessation

1. Each Party shall develop and disseminate appropriate, comprehensive, and integrated guidelines based on scientific evidence and best practices, taking into account national circumstances and priorities, and shall take effective measures to promote cessation of tobacco use and adequate treatment for tobacco dependence.
2. Toward this end, each Party shall endeavor to
 - a. design and implement effective programs aimed at promoting the cessation of tobacco use, in such locations as educational institutions, health care facilities, workplaces, and sporting environments;
 - b. include diagnosis and treatment of tobacco dependence and counseling services on cessation of tobacco use in national health and education programs, plans, and strategies, with the participation of health workers, community workers, and social workers as appropriate;
 - c. establish in health care facilities and rehabilitation centers programs for diagnosing, counseling, preventing, and treating tobacco dependence; and
 - d. collaborate with other Parties to facilitate accessibility and affordability for treatment of tobacco dependence including pharmaceutical products pursuant to Article 22. Such products and their constituents may include medicines, products used to administer medicines and diagnostics when appropriate.

Source: [WHO Framework Convention on Tobacco Control. \(2003\)](#). Retrieved from <http://apps.who.int/iris/bitstream/10665/42811/1/9241591013.pdf> (date last accessed December 4, 2012). Reproduced with permission from the World Health Organization.

Box 2: Summary of underlying consideration and key recommendations of the Article 14 guidelines*Underlying considerations*

1. It is important to implement TDT measures synergistically with other tobacco control measures.
2. Tobacco cessation and TDT strategies should be based on the best available evidence of effectiveness.
3. Treatment should be accessible and affordable.
4. Tobacco cessation and TDT should be inclusive.
5. Monitoring and evaluation are essential.
6. Active partnership with civil society.
7. Protection from all commercial and vested interests.
8. Value of sharing experience.
9. Central role of health care systems.

Recommended actions

1. Conduct a national situation analysis.
2. Create or strengthen national coordination.
3. Develop and disseminate comprehensive guidelines.
4. Address tobacco use by health care workers and others involved in tobacco cessation.
5. Develop training capacity.
6. Use existing systems and resources to ensure the greatest possible access to services.
7. Make the recording of tobacco use in medical notes mandatory.
8. Encourage collaborative working.
9. Establish a sustainable source of funding for cessation help.

Source: WHO Guidelines for Implementation of Article 14 of the WHO Framework Convention on Tobacco Control. (2010). Retrieved from <http://www.who.int/fctc/Guidelines.pdf> (date last accessed December 4, 2012). Reproduced with permission from the World Health Organization.

Research Priorities*Need to Understand Current Tobacco Use and the Effect of Policy on Behavior*

The Article 14 guidelines recommend that countries undertake a national situation analysis that should include the status and impact of current tobacco control policies (WHO Guidelines for Implementation of Article 14 of the WHO Framework Convention on Tobacco Control, 2010). A number of international tobacco surveys are in place to monitor tobacco use in general and special populations (Fong, Cummings, & Shopland, 2006; Global Tobacco Surveillance System, 2009). Countries also implement their own national surveys, and large research cohorts often include questions on tobacco use. However, survey tools vary, as do the methods in which tobacco use is assessed. Many are unable to tease out the effects of policy on cessation behavior (e.g., effect on quit attempts and cessation rates). Standardization of assessment tools would allow better comparison of data and assist with translation of findings between countries.

There are already some good examples of cross-sectional household surveys that produce nationally representative samples. The ITC project (Fong et al., 2006) has produced some extremely valuable data and now has well-tested methodology to measure the impact of policy on cessation behavior. Similarly the English "Smoking Toolkit Study" is providing useful data on quitting behavior of tobacco users and was able to monitor the effects of policy changes (e.g., smokefree environments, tobacco tax increase) on smoking prevalence and cessation attempts (Kotz, Fidler, & West, 2009).

Such research is useful to Parties at all stages of tobacco control and is relevant to a number of Articles of the FCTC. The

Global Adult Tobacco Survey (Global Tobacco Surveillance System, 2009) and other WHO-led global monitoring surveys such as the Global Health Professions Student Survey are good examples of international collaboration and standardization, and we recommend that all countries use such a standard tool, instead of or alongside their existing tools.

Need to Promote Cessation of Tobacco Use

Existing data support the use of mass media campaigns to promote cessation of tobacco use (Bala, Strzeszynski, & Cahill, 2008). Health warning labels (Hammond, 2011), increasing tobacco price (Ross, Blecher, Yan, & Hyland, 2011), smokefree environments (Hahn, 2010), and advice by doctors (Stead et al., 2008) are effective in prompting behavior change. For many LMICs, implementing these strategies will have an immediate effect. However, in countries with already strong tobacco control measures, there is a need for better understanding of which population-based strategies are most effective and cost effective and how these strategies affect different population groups (Lawrence et al., 2011). The messages conveyed should also be explored. Traditionally, mass media and education campaigns have warned people of the health risks of tobacco (Pierce & Gilpin, 2001). A change in approach that focused on exposing the truth about the tobacco industry showed success with young people (Richardson, Green, Xiao, Sokol, & Vallone, 2010). Could campaigns with a different focus (e.g., campaigns that focus on more positive messages and that build confidence in quitting) be effective in populations saturated with health messages? Mass media campaigns are also effective, encouraging the use of TDT products and services (Farrelly, Hussin, & Bauer, 2007; Mosbaek, Austin,

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High Income Countries	Low and Middle Income Countries
<p>(1) Need to understand current tobacco use and the effect of policy on behaviour</p> <ul style="list-style-type: none"> Monitoring and evaluation of interventions aimed at promoting cessation of tobacco use: This is a common need that spans all countries and calls for international collaboration with harmonisation of research methodology and outcome measures. 	
<p>(2) Need to promote cessation of tobacco use</p> <ul style="list-style-type: none"> Investigate the effect of new mass media campaigns that focus on (a) change in social norms, including use of tobacco in healthcare workers; (b) focus on emotional response; (c) promote the use of effective treatments; (d) reaching the sectors of society with greatest need Investigate more effective ways to integrate the provision of brief advice to quit smoking into routine clinical practice of healthcare professionals Investigate how advice to stop and referral to cessation services can be implemented into non-healthcare settings and determine the impact of such advice Investigate the role of religion and religious leaders and culture in promoting cessation and use of TDT 	<p>(2) Need to promote cessation of tobacco use</p> <ul style="list-style-type: none"> <i>Mass media campaigns that have been effective in other countries should be implemented and monitored</i> <i>Tobacco use in healthcare professionals should be monitored and cessation should be promoted</i> <i>Healthcare professionals should be trained to provide brief advice and implementation strategies that have been effective in other countries</i> Investigate more effective ways to integrate the provision of brief advice to quit smoking into routine clinical practice of healthcare professionals Investigate how advice to stop and referral to cessation services can be implemented into non-healthcare settings and determine the impact of such advice Investigate the role of religion and religious leaders and culture in promoting cessation and use of TDT
<p>(3) Need to enhance population based TDT interventions</p> <ul style="list-style-type: none"> Investigate modifications to telephone based interventions that increase the ability to help more people (e.g. identifying the best mix of support) Investigate use of mobile phone technology to increase cessation rates Investigate the use of web-based interventions to increase cessation rates Establish the efficacy of pharmaceuticals provided outside of healthcare settings 	<p>(3) Need to enhance population based TDT interventions</p> <ul style="list-style-type: none"> <i>Quitlines should be established and outcomes monitored</i> <i>Interventions delivered via mobile phones should be established and outcomes monitored</i> Develop TDT interventions that can be delivered as part of other healthcare and non-healthcare interventions and monitor the impact of these

Figure 1. Article 14 research priorities. Implementation priorities are also shown in *italics* to distinguish them from research priorities.

High Income Countries	Low and Middle Income Countries
(4) Increase training capacity	
<ul style="list-style-type: none"> Determine interventions that can deliver knowledge and skills on brief interventions for tobacco users to a wide group of healthcare providers in a low-cost and timely manner Evaluate the effect of training interventions on practice 	
(5) Implementation of TDT guidelines	
<ul style="list-style-type: none"> Identify key factors to dissemination and implementation of TDT guidelines <i>LMICs may be able to benefit from experience of other countries</i> 	
(6) Treatment for different types of tobacco use	(6) Treatment for different types of tobacco use
<ul style="list-style-type: none"> Investigate the use of behavioural and pharmacological interventions, both on their own and combined, to aid cessation of smokeless tobacco and dual tobacco use 	<ul style="list-style-type: none"> <i>Implement interventions that are known to help people cease use of smokeless tobacco and monitor (e.g. systematic screening for tobacco use, brief advice to stop, and cessation treatment)</i>
(7) Supply of low-cost pharmaceuticals	(7) Supply of low-cost pharmaceuticals
<ul style="list-style-type: none"> Investigate the efficacy of low-cost pharmaceutical products for aiding cessation of tobacco use (both smoked and non-smoked tobacco) 	<ul style="list-style-type: none"> Investigate how to make low cost medications more widely available, including through bulk purchase deals <i>LMICs should consider the use of low-cost pharmaceuticals with known efficacy and monitor outcomes associated with use</i> <i>Considering that many in LMICs buy single stick cigarettes countries should consider packaging NRT in smaller and lower cost packs and this approached evaluated</i>
(8) Investigate the use of non-pharmaceutical devices/products to aid cessation of tobacco use	
<ul style="list-style-type: none"> Investigate the efficacy and safety of non-pharmaceutical products such as the electronic cigarette Investigate efficacy of products that address the behavioural component (e.g. denicotinised cigarettes) in aiding cessation 	

Figure 1. Continued

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High Income Countries	Low and Middle Income Countries
<p>(9) Refinement of current TDTs</p> <ul style="list-style-type: none"> Identify elements of behavioural interventions that will enhance effectiveness Investigate the role of behavioural replacement Investigate if individualized treatment, especially in terms of which pharmacotherapy and dosing regimens, results in greater abstinence rates Investigate the role of chronic care models in TDT Develop and evaluate interventions aimed at young people, pregnant women, people with mental health illness and other chemical dependencies, and population groups high smoking prevalence (e.g. ethnic groups, lower socioeconomic groups, military personnel) 	<p>(9) Refinement of current TDTs</p> <p>The following research priorities identified for HICs may also be relevant to MICs</p> <ul style="list-style-type: none"> Identify elements of behavioural interventions that will enhance effectiveness Develop and evaluate interventions aimed at young people, pregnant women, population groups high smoking prevalence (e.g. ethnic groups, lower socioeconomic groups, military personnel)
<ul style="list-style-type: none"> Develop and evaluate behavioural interventions that reduce relapse rates Investigate whether long-term use of pharmacotherapy prevents relapse 	
<p>Overarching needs include:</p> <ul style="list-style-type: none"> Relevant interventions that are developed and tested in HICs should be able to implemented in LMICs in the future should they be successful Development of research capacity and collaboration which includes international funding of monitoring 	

Figure 1. Continued

Stark, & Lambert, 2007). For example, including a quitline number on cigarette packets increases requests for help (Wilson, Weerasekera, Hoek, Li, & Edwards, 2010). Could the messages be improved to further encourage people to seek help? Related to this is the need to encourage people to make better use of what is already available. This might include interventions that address some of the barriers to NRT use such as concerns about the safety of nicotine (Carpenter, Ford, Cartmell, & Alberg, 2011). A greater understanding of messages that are most relevant to sectors of the community where smoking prevalence is greatest would be beneficial. For example, campaigns that evoke an emotional response appear to be effective in promoting cessation in lower socioeconomic groups (Durkin, Biener, & Wakefield, 2009). Mass media campaigns have the potential to change social norms. Some campaigns have focused on this (e.g., “Smoking Not Our Future”—a New Zealand Campaign) and show signs of changing beliefs, but there is currently little evidence to show changes in behavior (Research New Zealand, 2008). Funding should be allocated for monitoring and/or evaluation as part of standard contracts for mass

media campaigns and other population-based interventions that prompt quitting.

Finally, proactive approaches, such as cold calling to promote quitting and inviting people to enroll in TDT services, need further investigation. There are data to suggest that these have potential (Tzelepis et al., 2011) but may not be appropriate for all groups (Glover, Fraser, & Nosa, 2012).

Integration of systematic screening of tobacco use and provision of brief advice into existing health care systems is relevant to all countries. However, the opportunity for health care workers to intervene is often missed (Omole, Ngobale, & Ayo-Yusuf, 2010). There are also barriers to implementation of these systematic approaches that need to be overcome before this is undertaken as part of “everyday clinical practice” (Wolfenden et al., 2009). Research should focus on implementation strategies, including levers (e.g., incentives, audit, and feedback) that might be used (Brinson & Ali, 2009). Above all else, the strategies implemented need to be easily adopted and sustainable and so future research should address this issue.

Tobacco users compared with never users’ are less likely to access clinical prevention services (Vander Weg, Howren,

& Cai, 2012), and people from lower socioeconomic groups report less access to primary care even when treatment is free (Mercer & Watt, 2007). In some Asian and African countries, up to 80% of the population utilize traditional medicine as their primary health care (World Health Organization, 2008a) and so relying only on practitioners trained in Western medicine to deliver TDT could potentially exclude many people. There are data to suggest that non-health care staff, such as social and community service workers (Johnston et al., 2005; O'Brien et al., 2012), outreach workers (Begh et al., 2011), and lay people (Castañeda, Nichter, Nichter, & Muramoto, 2010), can be trained to provide TDT. There, therefore, exists a need to research how to integrate screening and cessation advice into alternative health care and non-health care systems including agencies that deal with housing, financial aid, workplace wellness, and social support. It is unknown if screening for tobacco use is achievable in these settings and more importantly if provision of advice is seen as relevant and has an impact on tobacco cessation.

Religion and religious leaders may also be important in promoting and supporting smoking cessation (Yong, Hamann, Borland, Fong, & Omar, 2009). Ramadan, for example, is a period when Muslims fast and cannot smoke and is often used as a opportunity to promote smoking cessation (Aveyard, Begh, Sheikh, & Amos, 2011). Spiritual support may also be important to people who are quitting smoking (Gonzales et al., 2007; Kaholokula, 2008). However, there are few data regarding the involvement of religion and religious leaders in smoking cessation interventions, and there is a need for greater understanding of the acceptability and effectiveness of such approaches. Similarly, the role of culture and social structure could be explored further. Evaluations of some community-lead programs that have incorporated traditional customs and values have demonstrated success in the past (Groth-Marnat, Leslie, & Renneker, 1996), and researchers are starting to explore these factors again (e.g., Glover, Paton, Kira, Cowie, & Moetara, 2012), but again a greater understanding of the potential of these approaches is required before being rolled out.

Need to Enhance Population-Based TDT Interventions

Quitlines have proven efficacy in aiding tobacco cessation, and they are recommended by the guidelines as a key tool to assist tobacco users. A priority for countries that do not have a national quitline is to establish one (Raw, 2011; WHO Guidelines for Implementation of Article 14 of the WHO Framework Convention on Tobacco Control, 2010) and couple this with appropriate mass media campaigns (Chan et al., 2009). Although there is no reason to expect that quitlines will not be effective in other countries, there are likely to be some modifications needed to make services culturally appropriate (Moolchan et al., 2007). Text messaging may be effective and a much cheaper alternative for many LMICs.

Monitoring and evaluation of new quitline services are a key research need, and standard outcome measures and user feedback templates should be utilized. The outcome evidence on quitlines is very heterogeneous; thus, it is critically important how quitlines are set up and run. International collaboration between quitlines should be strengthened, and the recent establishment of the Asia Pacific Quitline Network is an example of sharing of good practices and collaboration.

For countries with established quitlines, research needs will be different. There is an increasing demand on telephone-based

services and so a need to be able to provide the best possible treatment within an often ever-decreasing budget. Identifying the best mix of support (e.g., frequency and length of calls, mix of telephone contact vs. other methods such as text- and web-based contact) is important. The U.S. guidelines show that the more intensive the service the better the outcome; however, these data are from indirect comparisons (USDHHS, 2008). Like new newly established services, existing services should routinely monitor data on service users and cessation outcomes.

Mobile phone-based interventions are an important area of research in both HICS and middle-income countries given the increasing penetration of mobile phones in these populations (International Telecommunications Union, 2011). There are sufficient data to warrant the implementation of smoking cessation interventions delivered via mobile phones in LMICs. Data from a large randomized controlled trial (RCT) of a text-based smoking cessation intervention delivered via mobile phones showed that this roughly doubled the chances of long-term cessation compared to a control intervention (Free et al., 2011). Furthermore, such interventions are relatively easy to establish and deliver and are relatively low cost. HICs should invest in research to investigate modifications of these simple and low-cost interventions. For example, more information is needed regarding the ideal content and frequency of text messages.

Interventions delivered over the Internet (Civljak, Sheikh, Stead, & Car, 2010) and videoconferencing (Carlson et al., 2012) have wide-reaching potential but need to be examined further, with attention given to content development and keeping the user engaged in the intervention (Shahab & McEwen, 2009). However, urgency of such research is not as great in LMICs where access to such technology is relatively low (Chinn & Fairlie, 2010).

The guidelines of Article 14 emphasize the need for more highly accessible TDT services, and there are likely to be many services, in both health care and non-health care settings, which could have TDT interventions included as part of routine practice. For example, there are opportunities, and a need (Drach et al., 2010), to integrate TDT into HIV/AIDS treatment programs, and although there are data showing that this can be done in traditional health care settings (Huber et al., 2012), there is a paucity of data exploring integration into non-health care settings. Similarly work has been undertaken to assess the feasibility and effectiveness of including TDT into TB clinics (World Health Organization, 2007), and guidelines based around the ABC approach for smoking cessation (McRobbie, Bullen, et al., 2008) have been produced by the International Union Against Tuberculosis and Lung Disease (Bissell, Fraser, Chiang, & Enarson, 2010). However, there are barriers (e.g., staff view TDT as a low priority) to the effective implementation of such interventions, especially in countries where tobacco control is relatively new (Shin et al., 2012). Many of these barriers could be overcome with educational strategies, which present an opportunity for research into techniques and programs that could be rapidly disseminated and implemented (see "Interventions that increase training capacity").

Further exploration of provision of pharmaceuticals via non-health care settings is also needed. Making NRT available over the counter in supermarkets and convenience stores increases accessibility and uptake (Shiffman & Sweeney, 2008) although the evidence for its effectiveness when used in this way is somewhat mixed (Hughes, Peters, & Naud, 2011;

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Leischow, Ranger-Moore, Muramoto, & Matthews, 2004). The provision of NRT, assuming affordability, could be extended to other nonhealth settings, (e.g., workplaces), but effectiveness and cost effectiveness of such initiatives need to be determined.

Interventions That Increase Training Capacity

It is known that training can make a difference to practice (Carson et al., 2012) although a single episode of training may not have lasting effects on practice (McRobbie, Hajek, Feder, & Eldridge, 2008). There is a need to provide training in both brief interventions, which is relevant to all health care workers and others, and more intensive interventions, such as those delivered by quitlines and other TDT services. The urgent research priority is the evaluation of training interventions to determine their effectiveness in changing behavior over both the short and long term. It is important that the outcomes measured are relevant to the goal. New training formats that can be used in health care and non-health care settings need to be developed and evaluated and their effect on sustained change in practice explored (Chan et al., 2011).

Research to Assess Impact of Implementation of Guidelines

Although not a research issue, many Parties do not have TDT guidelines. Raw, Regan, Rigotti, & McNeill (2009) surveyed 14 countries without TDT guidelines. Most of these countries were LMICs and cited lack of expertise and money as reasons and that support of this kind would be useful. There remains an opportunity to develop basic guidelines that countries can adapt, and a new initiative has been funded by Bloomberg Philanthropies to produce guidance on how to develop national treatment guidelines. The goal is to help countries develop guidelines, including by providing a concise and generalizable summary of the evidence base, in order to save them the time and expense—which can be considerable—of producing their own guidelines from scratch. This project aims to produce these tools to help countries by the end of 2012. The simple adoption of other countries' guidelines is unlikely to have significant impact as health care systems, settings, and priority populations vary greatly. Guidelines also need to reflect what TDT options are available locally. Guidelines are written to help change practice, but implementation is often inconsistent (Rothrauff & Eby, 2011) and not sustained (Shelley et al., 2011). A better understanding of key factors to successful implementation of TDT guidelines is needed.

Treatment for Different Types of Tobacco Use

Most cessation research has focused on smoked tobacco. There are limited data to demonstrate the efficacy of both behavioral and pharmacological interventions to assist with cessation of smokeless tobacco (Ebbert, Montori, Erwin, & Stead, 2011). Data from one study showed that varenicline, compared with placebo, was effective in aiding the cessation of smokeless tobacco (RR = 1.60, 95% CI: 1.32 to 1.87) (Fagerström, Gilljam, Metcalfe, Tonstad, & Messig, 2010). There are few data regarding the evidence for effective interventions for cessation of waterpipe users (Maziak, Ward, & Eissenberg, 2007). Although some forms of smokeless tobacco (e.g., Swedish Snus) are less harmful than smoked tobacco (Shin et al., 2012), given the health burden of smokeless tobacco in countries such as India (Patel et al.,

2011), this should remain a priority on the research agenda (Chan et al., 2012).

Supply of Low-Cost Pharmaceuticals

Cost is a significant barrier to use of effective treatment. Nicotine is cheap, but NRT is expensive, especially relative to tobacco, in many countries. What is cost effective in HICs may not be cost effective in LMICs (Higashi & Barendregt, 2012). Outcome studies of inexpensive NRT products that are manufactured to an appropriate standard are not required. Smaller studies that can demonstrate nicotine delivery and withdrawal relief would be adequate. Cytisine has already been highlighted as a potential low-cost, yet effective alternative medication (West et al., 2011). A review of countries that have reduced NRT costs through bulk purchase deals, and how they achieved this, could be of great use and should be a priority. It should be noted also that WHO has now included NRT (patches and gum) on their essential medicines list (World Health Organization, 2010).

Refinement of TDT

For many developed countries, there is a need for further refinement of TDT. For example, there is a need to identify elements of behavioral interventions that will enhance effectiveness; investigate the role of behavioral replacement; investigate if individualized treatment, especially in terms of pharmacotherapy and dosing regimens, results in greater abstinence rates; and research interventions aimed at young people, pregnant women, people with mental health illness and other chemical dependencies, and those from ethnic and socioeconomic groups with high smoking prevalence. Culturally appropriate TDT interventions also need to be considered, especially if the tobacco-related health inequalities are to be addressed (Moolchan et al., 2007). Relapse prevention interventions that include longer term use of pharmacotherapy and behavioral interventions are urgently needed (Hajek, Stead, West, Jarvis, & Lancaster, 2009).

Devices such as the electronic cigarettes are being heavily marketed to smokers. The research agenda for these devices has been outlined by others (Etter, Bullen, Flouris, Laugesen, & Eissenberg, 2011). Information is required on toxicity, pharmacokinetics, pharmacodynamics, optimal dosing regimens, and effect on withdrawal and smoking behavior (both cessation and reduction).

There is evidence to suggest that provision of interventions that address some of the behavioral aspects of tobacco use, smoking in particular, may aid cessation. Data from a large RCT suggest that this approach shows promise (Walker et al., 2012). These data need to be replicated in other studies, and some understanding of how acceptable these products will be to both smokers and health care providers needs to be gained to assist policy makers decide what role denicotinized cigarettes might play in TDT.

Perhaps more controversial is the use of smokeless tobacco products to help people stop smoking tobacco. Data from Scandinavian countries suggest that use of snus may be associated with people becoming former smokers (Lund, McNeill, & Scheffels, 2010; Lund, Scheffels, & McNeill, 2011). Whether we should consider snus as a smoking cessation aid is a topic of debate (Bolinder, 2003) but a worthy research question. There are data on faster acting NRT products to suggest that these

relieve craving and snus (Caldwell, Burgess, & Crane, 2010), and so these products may be a viable alternative. Long-term outcome and studies would help guide future direction.

New models of TDT need to be explored. The chronic care model, which is used in the management of other chronic conditions (e.g., COPD, diabetes), has not been widely adopted for TDT but is one that has demonstrated greater efficacy than the more standard TDT approach involving a discrete episode of care (Chan et al., 2012; Joseph et al., 2011). However, it is unclear which components of the model had the greatest impact (e.g., extended use of NRT, extended behavioral support or both), and more information is required regarding the cost effectiveness of this approach compared to usual care. In addition, the chronic care model needs to be examined in different populations and settings.

Finally, there is an ongoing research need regarding the cost effectiveness of TDT models. Although there is good evidence to show the cost effectiveness of TDT in HICs (Ruger & Lazar, 2012), not all interventions may be deemed cost effective when assessed against gross domestic product per capita in LMICs. This is illustrated in Vietnam, a lower MIC, where brief advice was “very cost effective,” but pharmaceuticals at their current cost were not cost effective (Higashi & Barendregt, 2012). This may be less of an issue for upper MICs (Gilbert et al., 2004). Consideration of cost effectiveness and affordability in LMICs should be made when designing and evaluating TDT interventions.

SUMMARY AND CONCLUSIONS

The focus of FCTC Article 14 is to (a) encourage more people to attempt to stop using tobacco and (b) use effective interventions to make the success of these attempts more likely.

The priority for countries with low levels of tobacco control is to implement effective strategies to promote cessation and then later provide TDT, starting with broad-reach low-cost interventions that, as far as possible, use existing infrastructure.

Countries with an existing and strong tobacco control framework should still focus on achieving full coverage of the basic approaches (e.g., brief advice to quit) within their health care systems and monitoring the impact of these. However, with increasing pressure to quit, there is likely to be an increasing demand for support. Although TDT services are effective, their impact can be improved by ensuring greater reach and efficacy. Small increases in long-term quit rates in interventions that have wide reach can have a significant impact at a population level.

The research associated with many of the interventions summarized in this article should first focus on monitoring and evaluation (WHO Guidelines for Implementation of Article 14 of the WHO Framework Convention on Tobacco Control, 2010). Monitoring tools that help countries better understand current tobacco use and the effect of policy on behavior are extremely useful for guiding future interventions. Methodology for monitoring and evaluation could be standardized to a degree. The use of standard cessation outcome measures should be promoted, as these will allow for comparison of services nationally and internationally and for service improvements. Following this, research should be directed toward interventions that (a) promote cessation of tobacco use,

(b) assist health care workers provide better help to smokers (e.g., through implementation of TDT guidelines and training), (c) enhance population-based TDT interventions, and (d) assist people to cease the use of other tobacco products.

Research expertise is clearly important. There are many research groups in developed countries, and many of these already collaborate with international partners. Agencies and organizations such as WHO TFI, Bloomberg Philanthropies, the Gates Foundation, The Union and the Campaign for Tobacco Free Kids could do a great deal to facilitate access to expertise and help to build local tobacco control research capacity and capability.

Countries need to play an active role in determining their own research agenda based on local need, and the priorities of Article 14 research need to be considered with those of the other FCTC Articles. If we are serious about an Article 14 research agenda in LMICs, then funding needs to be allocated. Generous funding from NGOs has been provided over the past 5 years for implementing the FCTC, but TDT has largely been excluded. Article 14 is wider than establishing specialist TDT service, and indeed, such services are recommended only after other steps have been implemented (WHO Guidelines for Implementation of Article 14 of the WHO Framework Convention on Tobacco Control, 2010). Within HICs, we should strive to fund research that has international application. Although we cannot ignore regional and cultural differences that drive a degree of specificity, there should be elements that are relevant to other countries and these should be disseminated. Article 14 of the FCTC and its guidelines, which in effect represent official policy on treatment for more than 176 FCTC Parties (in June 2012), covering 88% of the world's population, can serve as a focus to help countries design effective approaches to tobacco cessation support. We hope that HICs will acknowledge their role—and their treaty obligation—to encourage and support LMICs realize this goal, through genuine international collaboration. International cooperation on research and evaluation is an obligation of Articles 20 and 22 of the FCTC but has not yet been seen as a high priority by many countries, including those with research resources. It is time for HICs with good research infrastructure to consider seriously how they can help LMICs implement the FCTC.

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DECLARATION OF INTERESTS

HM has received honoraria for speaking at research symposia and received benefits in kind and travel support from and has provided consultation to the manufacturers of smoking cessation medications. HM has previously undertaken research on behalf of NicoNovum, but prior to the purchase of the company by R. J. Reynolds. MR does not accept funding from the manufacturers of stop smoking medications. SC does not accept direct funding

from manufacturers of stop smoking medications, but some of her previous studies had received free NRT for smoking clients. She has also provided smoking cessation counseling training for pharmacists, funded by Johnson and Johnson.

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