Reducing Cardiovascular Mortality Through Tobacco Control

A World Heart Federation Roadmap

Alice Grainger Gasser*, Cassandra Welch†, Monika Arora‡, Rohan Greenland§, Lubna Bhatti‖, Luminita Sanda‖, Rob Moodie¶, Eduardo Bianco#

Geneva, Switzerland; Nairobi, Kenya; New Delhi, India; Melbourne, Victoria, Australia; and Montevideo, Uruguay

1. BACKGROUND

1.1. The importance of tobacco control

1.1.1. Tobacco control's role in reducing CVD mortality

Without accelerating the implementation of comprehensive, effective tobacco control policy around the world, it will be virtually impossible to reduce premature mortality from non-communicable diseases (NCDs) by 25% by 2025 [1]. The tobacco epidemic is a leading cause of premature CVD mortality. Globally, tobacco causes 10% of all CVD deaths. The figure is higher at younger ages: more than one third of the CVD deaths (35%) in younger adults (under the age of 45) are attributable to tobacco use [2]. In nonsmokers, especially women, secondhand smoke (SHS) exposure substantially increases the risk of CVD; reducing SHS exposure rapidly lowers the incidence of heart attack.

1.1.2. Defining tobacco control

The actions needed to reduce CVD mortality from tobacco use and secondhand smoke exposure are based on the tobacco control policies set forth in the WHO Framework Convention on Tobacco Control (WHO FCTC) [3]. The WHO FCTC sets out a comprehensive package of evidence based policy interventions for reducing both demand for and supply of tobacco and represents a strong global consensus on best practice in tobacco control. For clarity and focus, the WHF Tobacco Control Roadmap highlights the policies that are most cost-effective for reducing demand for tobacco.

1.1.3. What must be achieved by 2025

The WHO Global Action Plan (GAP) for the Prevention and Control of NCD's 2013–2020 establishes a voluntary target of reducing prevalence of tobacco use by 30% by 2025. The two components of lowering prevalence of tobacco use are reducing tobacco initiation (particularly among youth and women) and increasing quit rates for current smokers (who are primarily adult males) (Figure 1). To meet GAP mortality targets by 2025 will require a rapid increase in quit rates among current users; sustaining progress over the longer term will depend upon reductions in initiation of tobacco use. Independently of reduction of the prevalence of tobacco use, reducing non-smokers' exposure to SHS will reduce premature CVD mortality. Accelerating tobacco control measures in order to exceed the target on tobacco is one of the most feasible ways to achieve the overall GAP mortality target; globally, achievement of a 50% reduction in the prevalence of tobacco use would allow us to almost achieve the overall target for mortality [4].

1.1.4. Roadmap to stronger tobacco control

The WHO FCTC provides a detailed roadmap of evidence-based policies that reduce tobacco initiation, increase quitting, and protect from SHS. Most countries are party to the treaty and so are legally bound to enact the policies in the WHO FCTC. The GAP galvanizes commitment to WHO FCTC implementation and provides a framework for enlisting and coordinating multi-sectoral support for it. The WHF Tobacco Control Roadmap charts priority interventions for implementing the WHO FCTC, identifies obstacles to implementation of its policies, and indicates paths to bypassing these obstacles. Its milestones mark progress toward both achieving the GAP target on tobacco and more broadly, reducing CVD mortality through tobacco control. It indicates progress in both processes (e.g., enacting and enforcing policies and strengthening health systems) and outcomes (e.g., reduction in tobacco use, change in norms, and reduction of mortality). For additional information on tobacco cessation strategies see the WHF companion Roadmaps for Secondary Prevention and Hypertension.

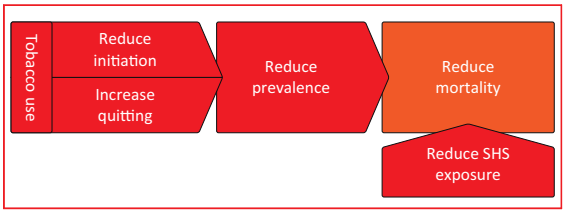

FIGURE 1. Actions for reducing CVD mortality related to tobacco. SHS, second-hand smoke.

1.2. The problem of tobacco

1.2.1. Death and disease from tobacco use

Tobacco is the only legal product, that when used as directed, kills a large proportion of its users [5,6]. Tobacco is now estimated to cause approximately 6 million deaths yearly. The majority of these deaths are among males. Globally, smoking prevalence is about five times higher among men (37%) than among women (7%) [5,7]. The

Alice Grainger Gasser, Cassandra Welch, Monika Arora, and Eduardo Bianco have worked on projects funded by pharmaceutical companies producing medication for tobacco dependence treatment. The remaining authors report no relationships that could be construed as a conflict of interest.
From the *World Heart Federation, Geneva, Switzerland; †CWJ Consulting, Nairobi, Kenya; ‡Public Health Foundation of India, New Delhi, India; §Heart Foundation, Melbourne, Victoria, Australia; ‖World Health Organization, Geneva, Switzerland; ¶University of Melbourne, Melbourne, Victoria, Australia; and the #Framework Convention Alliance (FCA), and The Center for Research on the Tobacco Epidemic (CIET), Montevideo, Uruguay. Correspondence: A. Grainger Gasser (alice.graingergasser@worldheart.org).

GLOBAL HEART

VOL. 10, NO. 2, 2015
ISSN 2211-8160/$36.00.
http://dx.doi.org/10.1016/j.gheart.2015.04.007

only common risk factor that applies to the four major NCD disease groups, tobacco causes diseases in nearly all organs of the body; it also harms the fetus, impairs immune function, and causes inflammation. Chemicals in tobacco interfere with reproductive processes, increase complications of pregnancy, cause low birth weight, and damage DNA. The cardiovascular damage from cigarette smoking is immediate and there is no safe level of exposure to tobacco smoke [8]. No cigarette is safe: low-tar, and "light" cigarettes do not reduce the risk of death and disease.

Globally, tobacco causes 10 percent of all CVD deaths; in some countries the figure reaches up to 25 percent of CVD deaths before age 60 [2]. A major cause of coronary heart disease, stroke, aortic aneurysm, and peripheral artery disease [8], smoking doubles the risk of heart attacks and strokes [9], making some consider tobacco use to be the most significant modifiable cardiovascular risk factor [10]. People who smoke present with myocardial infarction at a younger age than either nonsmokers or those who have quit [11].

In some areas, smokeless tobacco use is a major health problem, especially in South Asia, where it is very common, particularly among women. Widely perceived to be safer and more appropriate for women and children than cigarettes, the use of water pipes damages cardiovascular, pulmonary, and oral health, and harms the fetus in ways similar to cigarettes [12]. Although risks from smokeless tobacco like snus may be lower than the risks associated with smoked tobacco, there is evidence suggesting a link between CVD risks (including hypertension and changes in lipid profile) and the use of smokeless tobacco [13,14].

1.2.2. Death from SHS exposure

Tobacco smoke includes hundreds of toxins, and exposure to SHS kills some 600,000 people each year; worldwide, some 87% of adult deaths from SHS exposure are caused by CVD [15]. In non-smokers, SHS exposure increases the risk of CVD by approximately 25–30% [8], can increase the severity of heart attacks [16], and increases the risk of strokes by 20–30% [9]. CVD risk rises steeply at lower exposures to SHS, so even low levels of exposure result in increased risk [17–19], and there is no safe level of exposure [19].

1.2.3. Tobacco addiction

Tobacco is highly addictive [20]. Nicotine is the main cause for the addictive properties of tobacco. Psychosocial, biological and genetic factors appear to play a role in nicotine addiction. As with other addictive substances like heroin and cocaine, nicotine undermines users' freedom of choice about quitting and can thwart adherence to medical advice and treatment. Often adolescents' bodies are particularly susceptible to addiction and they become addicted more quickly than adults.

1.2.4. The tobacco industry

The tobacco industry is the cause of the tobacco epidemic. Its activities are also the most important vector of disease transmission, and the biggest barriers to disease control. Its activities are facilitated by global trends such as trade liberalization, transnational marketing, and illicit trade. There is a global consensus that there is a fundamental contradiction between public health and the interests of the tobacco industry [21]. The fact that the dangers of tobacco affect all social, ethnic, religious, and political groups would make it logical for tobacco control to be everyone's priority, but the wealth and power of the tobacco industry pushes protection from tobacco beyond the realm of the health system and into the political arena. While the health system is part of the solution to the tobacco epidemic, many of the actions required for tobacco control depend upon other sectors concerned with the broader economic and social activities that feed the business of tobacco production and sale. The lessons learned from tobacco control provide valuable insights and experience for tackling other NCD risk factors that are driven by business interests and/or social and economic forces.

1.2.5. Perception of tobacco use as fashion, "lifestyle choice", or right

Tobacco use is deeply ingrained in many societies, and reducing tobacco prevalence will require a strong and sustained commitment to changing social norms around tobacco use. Norms that limited tobacco use in some countries (particularly women's tobacco use in Asia and the Middle East) are being eroded by the tobacco industry's aggressive marketing campaigns. The tobacco industry spends tens of billions of dollars to promote its products, framing tobacco use as a personal choice that expresses identity and sustaining the perception of tobacco use as a normal activity or even a right. The widely-held perception that tobacco use is not an addiction or illness but a "lifestyle choice" has been an important barrier to putting effective policies in place, but this barrier is being overcome in a growing number of countries.

Tobacco industry advertising, promotion, and sponsorship activities associate tobacco use with fashion, friendship, independence, freedom, fun, sexual attractiveness, identity and belonging, social status and power. It particularly targets future markets of youth, women, and low- and middle-income populations.

Tobacco advertising causes tobacco use to increase and even brief exposure to it can influence adolescents [22]. Advertising and brand imagery encourage youth to start smoking and for those who are addicted, serve as cues to stimulate the cravings that make it hard to quit. In addition to traditional means of advertising, such as promotion on television, radio, and in printed media, tobacco products are advertised at point of sale, over the internet and other social media, through promotional schemes including giveaways and sales, and through tobacco packaging. Packaging is often designed to appeal to young people and women, to give the impression that products are safe, or undermine the effectiveness of health warnings [23].

The tobacco industry uses the sponsorship of charities and cultural activities under the guise of corporate social responsibility to improve its image among the public,

policymakers, press, and regulators. The tobacco industry also uses sponsorship and brand stretching (i.e. using tobacco brands on other lines of products, such as clothing) as an additional way to promote its products and sustain brand recognition.

Although many countries have banned forms of tobacco advertising, the industry continues to find innovative ways to exploit exceptions or loopholes in advertising bans, often using new technologies or forms of global marketing that are difficult to regulate nationally.

1.2.6. Underestimation of the risks of tobacco use and exposure

In its aggressive strategies to promote tobacco, the industry has deliberately misled the public about the risk of its products [9]. Awareness is particularly low about links between CVD and tobacco: even in countries with high levels of health literacy, where decades of health promotion have raised public awareness of the health harms of tobacco, people know less about the cardiovascular harms of tobacco than they do about tobacco's links to cancer and lung disease. In China, where stroke is the leading cause of death, two-thirds of all smokers still do not know that smoking causes strokes. In India, more than a third of all smokers are unaware that smoking can cause heart attack [24]. Levels of knowledge about the cardiovascular effects of SHS are even lower: while CVD accounts for more than ten times more SHS deaths than cancer does, public awareness of links between cancer and SHS remains significantly higher than awareness that SHS causes heart disease [24].

1.2.7. Availability and affordability of tobacco

In many countries, tobacco products are available everywhere and are widely affordable. Ease of access to tobacco products is an important factor in both initiation of tobacco use and in undermining the decision to quit. Young people and low-income populations are particularly sensitive to the affordability of tobacco, which is a major determinant of tobacco initiation. As economies grow and incomes rise, tobacco products become more affordable, and as this happens, consumption rises independently of marketing by tobacco companies. Making tobacco products available and affordable to children and young people and to others with limited resources (e.g., promoting sale as "single sticks") is one way of sustaining tobacco use in groups that would otherwise not be able to afford tobacco products regularly. Illicit tobacco trade also makes cheaper cigarettes available on the market. While most countries prohibit tobacco sales to minors, some do not enforce regulations and distribution through vending machines makes control of sales to minors very difficult.

1.2.8. Social and environmental impact of tobacco

Tobacco use and SHS exposure violate the human right to the realization of the highest attainable standard of health, and tobacco is an important cause of health inequalities. While the prevalence of tobacco use (and related deaths) is falling in most high-income countries, it continues to rise in many of the low- and middle-income countries where over 80 percent of all smokers now live. Within high-income countries, smoking prevalence is highest among lower socioeconomic groups. Both the costs of tobacco and the costs of healthcare for the consequences of its use are very high, robbing poor families of resources needed for basic necessities like food, or for investments like education.

Tobacco workers have poor conditions of work and they face occupational risks including green tobacco sickness (caused by absorption of nicotine through the skin). Child labor is very common in tobacco production. Tobacco production also has an impact on food security, using land that could be used for food production and depleting nutrients in the soil. It causes deforestation, uses harmful pesticides, causes soil erosion, and depletes supplies of water and wood.

2. THE ROADMAP FOR TOBACCO CONTROL

Roadblocks to progress and potential solutions are outlined in Table 1.

TABLE 1. Roadblocks to progress and potential solutions

Roadblock	Potential solutions		
Availability/ affordability of tobacco	Raise tobacco prices	Combat illicit trade	Ban vending machines and sales to minors
Perceptions/norms support smoking	Enact and enforce 100% smoke-free policies	Enact and enforce comprehensive ad (TAPS) bans	Develop and run effective and targeted media campaigns
Poor awareness of risks of tobacco use	Develop and run effective media campaigns	Include graphic warning labels on all tobacco products	Require plain packaging of tobacco products
Poor accessibility and affordability of cessation support	Ask about tobacco use and provide systematic brief advice	Establish quit lines	Make medication and counselling available/ affordable
SHS exposure	Institute and enforce 100% smoke-free public places	Advocate for smoke-free homes and cars	Develop and run media campaigns
Low priority within governments	Support tobacco control alliances and link them to NCD alliances	Show cost-effectiveness of tobacco control policy	Engage non-health sectors
Inadequate resources for implementation	Raise tobacco taxes and earmark and increase domestic allocations for tobacco control	Leverage existing programs and infrastructure	Integrate into development plans
Poor inter-sectoral coordination	Develop coordinating mechanism	Convene key sectors (health and non-health)	
Tobacco industry interference	Enact laws to end interference	Expose and counter tobacco industry tactics	

2.1. The solution — comprehensive tobacco control

The comprehensive tobacco control policies outlined by the WHO FCTC, if effectively implemented and enforced, can reduce both tobacco use and exposure to SHS. All of the measures in the WHO FCTC are important; when enacted together their outcomes are synergistic. To assist in the country-level implementation of measures to reduce the demand for tobacco, the WHO has introduced the MPOWER package, a set of six key cost-effective elements of WHO FCTC implementation:

- **M**onitoring tobacco use and prevention policies;
- **P**rotecting people from tobacco smoke;
- **O**ffering help to quit tobacco use;
- **W**arning about the dangers of tobacco;
- **E**nforcing bans on tobacco advertising, promotion and sponsorship; and
- **R**aising taxes on tobacco.

Case study [33]

Comprehensive tobacco control in Turkey

Turkey was one of the first parties to the WHO FCTC. After ratifying the treaty in 2004, the Ministry of Health created a National Tobacco Control Committee, which prepared a national tobacco control programme and an implementation plan. It strengthened its tobacco control law in 2008, establishing inspection teams. The law strengthened Turkey's smoke-free law. Since then it has conducted the Global Youth Tobacco Survey (GYTS) and the Global Adult Tobacco Survey (GATS), established a national quit line, enlarged graphic warnings and run mass media campaigns, implemented a comprehensive advertising ban (including sponsorship, brand sharing and brand stretching, and restrictions on retail display), and raised tobacco taxes to be 80% of the retail price. The result has been that between 2008 and 2012, the prevalence of tobacco use has declined by more than 13%, although it still remains very high for males.

It is estimated that the implementation of these key policies between 2007 and 2010 will avert more than 7.4 million deaths linked to tobacco use [25].

Governments party to the WHO FCTC have agreed upon guidelines for how to implement these measures, and the WHO Report on the Global Tobacco Epidemic monitors implementation of these key policies in all countries of the world [26]. Governments party to the treaty are obligated to report on their progress in implementing all elements of the convention; the Global Progress Report on the Implementation of the FCTC summarizes information from the reports [3].

The WHO FCTC recommends that every country establish a national tobacco control program and fund a mechanism for coordinating it. National tobacco control programs need support from different ministries of the government and different segments of civil society.

Enactment and enforcement of tobacco control policy has already begun to reduce the prevalence of tobacco use in most countries of the world. If current trends continue, 37 countries will achieve the GAP tobacco use target for men, and 88 will achieve it for women [27]; Countries like Uruguay and Turkey that have implemented the comprehensive package of tobacco control measures in the WHO FCTC have shown rapid decline in smoking prevalence [28—30]. In Turkey, smoking has gone down by a relative 13.4% between 2008 and 2012, and admissions for heart attacks declined significantly in the year following the implementation of smoke-free law [31]; following implementation of a comprehensive tobacco control law in Uruguay, smoking prevalence dropped by 25% over three years, and in the year after the law went into effect, heart attack admissions dropped by 22% [32].

2.2. Key components of tobacco control

2.2.1. Raising taxes on tobacco

Raising taxes on tobacco is the most effective way to increase tobacco prices and therefore reduce tobacco use. Youth and low- and middle-income populations respond most to tax increases. In high-income countries, a 10 percent increase in tobacco prices reduces consumption by about 4 percent [33]. Studies show that this effect is not only sustained, but actually increases over time. It is estimated that effective tobacco tax policies enacted between 2007 and 2010 will avert 3.5 million deaths [25].

Because they reduce tobacco use among the poor more than the wealthy, tobacco taxes reduce health inequality. The positive health effect is probably even greater in low-income countries, where a higher proportion of the population is poor; poor smokers who will not or cannot quit will, however, be further stressed by increased prices, so it is important to ensure that they have access to help quitting and that they are targeted in media campaigns on quitting. Guidelines to Article 6 of the WHO FCTC define principles of effective tobacco tax policy. Tax systems vary

Case study [34]

Tobacco taxes in the Philippines

In 2012, the Philippine Department of Finance led what was commonly called "Sin Tax" reform, simplifying the system, adopting many best practice policies specified by the World Health Organization and making reforms that would ensure steady increases in the tax rates. The reform went into effect in 2013. By early 2014, rapid surveys in two different locations documented a significant drop in average weekly cigarette consumption and an increase in quitting. The government had collected more revenues than it expected, and 85% of these were dedicated to providing universal health coverage and improving health facilities in the Philippines.

widely between countries and there is no single system for raising taxes that can be used universally. Because tobacco products are price inelastic, the increase in tax rates is proportionally larger than the decline in consumption, meaning that revenues rise even as consumption declines.

2.2.2. Enforcing bans on tobacco advertising, promotion, and sponsorship

Comprehensive bans on tobacco advertising, promotion, and sponsorship (TAPS) decrease tobacco use. Some countries have experienced a decline in consumption of up to 16 percent after the introduction of advertising bans. It is estimated that TAPs bans put into place between 2007 and 2010 will reduce the number of smokers by over 600,000 and avert over 300,000 deaths [25].

To be effective, TAPS bans must apply to all advertising, promotion, and sponsorship (donation to any activity, event, or individual) without exemptions. They must be monitored and have sanctions for violation [26]. Guidelines to Article 13 of the WHO FCTC give more detail on how to design and implement effective advertising bans, offering a non-exhaustive list of the means of advertising which must be covered in comprehensive bans. In 2013, the WHO reported that 24 countries, with 10% of the world's population, had passed complete TAPS bans.

Several parties have banned tobacco advertising at points of sale and others have extended bans to include electronic nicotine delivery systems (e.g., e-cigarettes).

In 2011, Australia pioneered plain packaging for tobacco products, banning the use of colors, corporate logos, trademarks, and misleading descriptors on tobacco packages. There is evidence that plain packaging is working as intended and will contribute to reducing youth initiation of tobacco use [35]. Recently the UK, Ireland and France have adopted legislation to put plain packaging into place and several other countries, including New Zealand and Norway, are considering the policy.

2.2.3. Protecting people from SHS

Smoke-free policy clearly reduces the incidence of premature heart attacks and other coronary events; there is evidence to suggest that it also reduces stroke mortality [9]. Numerous studies have documented a reduction of admissions for myocardial infarctions within the first year of implementation of smoke-free law [36]. Since smoke-free law is relatively inexpensive to implement, it is a cost-effective way to prevent heart disease and heart attacks and to reduce related medical and economic costs.

Best practice smoke-free policy applies to all indoor workplaces and indoor public spaces and is legislated, not voluntary. It does not include exceptions such as designated indoor smoking areas, which reduce the protective value of the policy and make it more difficult to implement. Guidelines to Article 8 of the WHO FCTC define best practice in smoke-free policy.

Over the past decade there has been considerable progress in the enactment, implementation, and enforcement of smoke-free policy; in 2013, it was the most widely accepted of the key, cost-effective tobacco control measures. Some countries, such as Australia, parts of the United States, and Russia, are enacting smoke-free legislation that bans smoking in sporting venues, parks and playgrounds, beaches, and where families and children gather.

Even with this success, only 16% of the worlds' population is covered by optimal smoke-free policies [26]. Compliance with, and enforcement of, these policies varies widely between countries and is not reflected in these figures.

2.2.4. Warning people of the dangers of tobacco addiction and exposure

Warning people about the dangers of tobacco use is critical to preventing its initiation and can help create a supporting environment for quitting. The two most effective ways to warn the public are through mass media campaigns and graphic warning labels on tobacco products.

Televised mass media campaigns contribute to reduction in smoking prevalence in adults, making them particularly important for achieving short-term targets for reducing premature mortality. This effect occurs relatively quickly (within two months) but dissipates when advertisements end, suggesting that to obtain sustainable results, campaigns need to be aired repeatedly [37–40]. To promote sustainability, countries, such as Turkey and Thailand, have created systems that ensure time, and/or resources, for tobacco control public service announcements.

Principles for effective communication about tobacco are outlined in the guidelines to WHO FCTC Article 12. Campaigns need to target specific audiences and cover all audiences at risk, including women, minority groups, and illiterate populations. In 2013, the WHO reported that 54% of the world's population was reached by tobacco control mass media campaigns [26].

Graphic warning labels are an extremely cost-effective way to reach a large part of the population with information about the harms of tobacco. The introduction of graphic health warnings is associated with increased thoughts about quitting and in foregoing cigarettes, both of which are related to quitting and preventing relapse [41–43]. Graphic warnings can be especially useful for informing populations with lower literacy rates about the health risks of tobacco use and SHS exposure [44,45]. Evidence suggests that graphic warning labels are more effective than text-only labels, and in particular, that they reduce disparities in knowledge of health risks between different educational levels [46].

Article 11 of the WHO FCTC provides guidance for effective use of graphic warning labels. The size and placement of graphic warning labels are important to

ensure their effectiveness, and the images should be rotated periodically to maintain their effect.

In 2013, the WHO reported that there were 30 countries with best-practice warning labels, accounting for 14% of the world's population [26].

Case study [47]

The Artery Ad

In 1997, Australia launched a national tobacco campaign called *Every Cigarette is Doing You Damage*, aimed at making smokers recognize the health effects of tobacco use at a personal level by showing the health consequences in a graphic way. The campaign was associated with a 1.4% decline in smoking in the first six months after it was aired, and was recognized as one of Australia's best anti-smoking campaigns. One ad, "The Artery", showed fatty deposits being squeezed out of the aorta of a 32-year-old smoker. Since then, over 40 countries have licensed and used the ad. When similar imagery was adopted for graphic warning labels 10 years later, formative research showed that teenagers (who were too young to have seen the original ad) did not understand messaging about smoking clogging your arteries. The original ad was revived and linked to the images on the cigarette pack. Interviews with viewers showed that over 90% found the ad believable and 70% agreed that it made them stop and think. Tested and evaluated in 10 different low- and middle-income countries by the World Lung Foundation, the artery ad has been found to work well in different settings.

The ad can be viewed at: www.youtube.com/watch?v=lEc-Rsv9pMc.

2.2.5. Offering help to quit

Treating tobacco dependence is a cost-effective health intervention that is a critical part of both primary and secondary prevention of heart attack and stroke. Quitting smoking improves health at any age [8]. It rapidly reduces smokers' risk of myocardial infarction and stroke [8] and reduces the risk of mortality by more than 35 percent in smokers with coronary heart disease [11]. Within a year of quitting, smokers' risks of experiencing a heart attack drop sharply and within 2–5 years their risks of heart attack are nearly as low as if they had never started [8].

Interventions to support smoking cessation are more effective in smokers who are motivated to quit. Media campaigns, smoke-free policy, tobacco taxes, ad bans, and graphic warning labels provide an environment that encourages quitting and increases the effectiveness of interventions for cessation support. Tobacco dependence treatment should, therefore, be carried out as one element of a broader strategy for tobacco control. Brief advice to quit from a primary care physician during a routine consultation increases the number of smokers stopping for at least six months [48].

Guidelines to Article 14 of the FCTC define best practice in policy on tobacco cessation. Cessation support and tobacco dependence treatment need to take gender, culture, socioeconomic background, literacy, and special needs of groups with high rates of tobacco use into account. They should be monitored and evaluated, and conducted in collaboration with civil society. They must be protected from commercial interests [49].

All healthcare workers should be trained to systematically ask about tobacco use and SHS exposure, record it in medical notes, and give brief advice. As a critical first step, healthcare workers who are tobacco users should also be encouraged and supported to quit. Quit lines are low-cost ways of extending access to counseling, as are internet and text-message cessation support. Improving the accessibility and availability of medications and counseling can increase the number of quit attempts, and increase the chances of success. Nicotine replacement therapy is on the WHO Essential Medicine list, and has been added to national essential medicines lists in over 30 countries. Other medications that are effective for tobacco dependence treatment are varenicline and bupropion; there is evidence that cytisine, which is far lower cost and more affordable for low-income settings, may also be effective.

Case study [50]

Uruguay Offers Help Quitting

The National Resources Fund (FNR) in Uruguay began offering treatment for tobacco dependence in 2004, making it available free of charge in most of the country. By 2005, the FNR had trained personnel and provided free medications for more than 100 new tobacco dependence treatment programs in the country. The 2008 Smoking Control Regulations integrated tobacco dependence treatment into the National Healthcare system, requiring all healthcare providers, in both public and private health services, to include the diagnosis and treatment of tobacco dependence in their primary health care programs and plans, and smoking status to be recorded in all medical notes. The regulations mandated that healthcare providers follow evidence-based national guidelines for treating tobacco dependence and that healthcare institutions train health workers in primary care to treat tobacco dependence.

Pharmacotherapy, including nicotine replacement therapy (NRT), bupropion, and varenicline are available at community pharmacies, and NRT and bupropion are included on the Ministry of Health Formulary and thus fully subsidized. In March 2013, the Ministry of Health set up a toll-free telephone quit line, promoting its number on cigarette packaging.

2.3. The roadblocks for implementing comprehensive tobacco control

In spite of the effectiveness of tobacco control policies, and the progress made implementing them since the WHO FCTC went into effect, many people are still not protected

by the measures in the treaty. There is significant variation between implementation of different measures, with the most effective measure (taxation) having the lowest rate of implementation [26]. Governments working to implement the WHO FCTC report that the primary barrier to implementation of tobacco control is tobacco industry interference. Other barriers are lack of political will, inadequate financial and technical resources for implementation and enforcement of tobacco control policies, and weak mechanisms for coordination between health and other sectors at national level [51]. All of these barriers are interconnected.

2.3.1. Tobacco industry interference

Governments report that the tobacco industry's efforts to undermine tobacco control policy are the biggest barriers to implementation of the WHO FCTC. These include influencing the political and legislative process by lobbying, making gifts to governments, drafting legislation, and entering into partnerships with government; distorting, hiding, or denying information on the health harms of its products; manipulating public opinion through the media, front groups, and corporate social responsibility (CSR); discrediting proven science and generating junk science; and influencing decision makers and opinion leaders by financing research or cultural/charitable activities. A worrying threat to progress in tobacco control law is the tobacco industry's recent use of litigation through trade law to intimidate governments enacting strong tobacco control law related to packaging (e.g. plain packaging and graphic warnings).

2.3.2. Insufficient political will

Most countries of the world have agreed to be bound by the WHO FCTC, but there remain notable exceptions (including Argentina, Cuba, Indonesia, Mozambique, Switzerland, and the United States [as of March 2015]) [52]. Among the countries party to the treaty there is a great deal of variation in its implementation and enforcement. Some parties have not revised any national laws to align them with treaty obligations; others have weak legislation (with loopholes that make it easy to evade), or fail to enforce legislation in place.

This delay or ineffectiveness in meeting treaty obligations is often linked to tobacco industry interference. It can also be caused by the perception that other issues are more pressing and deserving of government attention and resources, or that tobacco use is a personal choice rather than a public threat that should be addressed by policy.

2.3.3. Lack of resources

Governments report that the lack of technical and financial resources is another barrier to implementation of tobacco control policy. WHO FCTC implementation is seriously under-resourced, both at global and national levels. In 2011, the WHO reported that only $1 billion was spent on implementing the treaty [53]. While tobacco taxation is the best potential source of sustainable funding for implementation of tobacco control, governments spend far less on tobacco control than they gain from tobacco taxation.

Article 26 of the WHO FCTC urges parties to the treaty to use bilateral, regional, sub-regional, and multilateral channels to assist countries unable to meet treaty obligations. To date, few countries have provided such assistance. Much of the technical assistance currently used by low-income countries comes from philanthropic sources. NCDs are allocated between 1% and 3% of international development assistance, and tobacco control is only a part of spending on NCDs [54].

2.3.4. Poor inter-sectoral co-ordination

The production, distribution, marketing, sales, and use of tobacco involve complex interactions within and between many economic, social, legal, and administrative processes, and controlling them requires commitment and action from different sectors of government and society. While health professionals and ministries of health often understand and are committed to strong and comprehensive tobacco control, many in other sectors (e.g., trade, agriculture, finance, marketing) and the ministries that regulate their activities, do not perceive health to be their business, and may not take health impact into account as they develop policy or practices in their domains. Making tobacco control a whole-of government priority is the only way to overcome this challenge, and it requires inter-sectoral coordination. Governments report that the lack of coordination mechanisms at country level is an important barrier to the implementation of tobacco control. Even within the fields of health and development, the tobacco control movement has yet to develop strong alliances with civil society groups concerned with issues worsened by the tobacco industry (e.g., the environment, food/water security, human rights, womens' rights, education, or other areas of health such as tuberculosis, maternal child health, HIV/AIDS).

2.3.5. Weak health system capacity

Health system capacity to either deal with the consequences of tobacco use and exposure, or to provide support to tobacco users who want to quit is very weak in most low- and middle-income countries. In many countries, medicines for tobacco dependence treatment are not even available, and where they are available, they are often not affordable for the majority of the population. Even in some high-income countries, treatment for tobacco dependence is not systematically reimbursed by insurance. In many countries, numerous health professionals still use tobacco, making it difficult for them to give effective advice about quitting. Even in high-income countries, programs training health professionals seldom offer adequate training on either counseling or offering pharmacological treatment to help patients quit.

2.4. Bypassing barriers

2.4.1. Confronting tobacco industry interference

There are a number of actions that government and civil society can take to minimize interference of the tobacco industry in formulation of policies that can have an impact on health. These include:

- Limit government interactions with the tobacco industry and ensure the transparency of the interactions that do occur
- Discourage and, when possible, regulate activities described as "socially responsible" by the tobacco industry
- Ensure that international organizations and networks do not collaborate with the tobacco industry or in any way spread its influence or serve its interests
- Monitor and expose tobacco industry interference with tobacco control policies; and
- Establish and enforce strict conflict of interest policies in order to prevent any collaboration with the tobacco industry.

WHO FCTC Article 5.3 Guidelines offer guidance to governments in how to meet treaty obligations to resist tobacco industry interference. Recent examples of best practice include divesting government investments in the tobacco industry and adopting strict guidelines for government employees' interactions with the industry, such as the United Kingdom's guidance for embassies' interactions with the tobacco industry [3].

2.4.2. Galvanizing political will

Most countries already have civil society alliances that are working to advance tobacco control law; many of them work closely with their Ministry of Health and the WHO. In many countries, the public supports tobacco control more than politicians do. Groups committed to strengthening tobacco control law can:

- Join, fund, and provide political support for civil society alliances advocating for implementation and enforcement of tobacco control policies
- Develop an active movement to broaden the base of support for these alliances, seeking synergies with civil society groups from both within and outside of the health sector including groups of women, youth, workers, employers, religious organizations, the media, and private sector.
- Work to develop support for tobacco control from all political groups (including both the government and the opposition); run opinion polls on tobacco control policies and share results with decision makers;
- Generate and/or disseminate data on the economic, environmental, and social harms of tobacco and use it to engage non-health ministries in tobacco control (e.g., ministries of finance, commerce, development, agriculture, environment, culture) and broaden support in civil society; and
- Measure progress in tobacco control using both existing mechanisms for monitoring/data collection and shadow reporting.

2.4.3. Establishing sustainable financial resources

Actions to help increase funding for tobacco control include:

- Advocate for higher tobacco taxes and ensure that the proportion of returns invested in implementation of tobacco control is sufficient
- Use litigation against the tobacco industry to generate funding for tobacco control
- Fund or conduct research on the costs of action and inaction in tobacco control
- Advocate for integration of WHO FCTC implementation into post- 2015 development goals and national development assistance frameworks
- Advocate with donor countries to provide low- and middle-income countries with bilateral "startup support" for WHO FCTC implementation, including assessing country needs and barriers
- Integrate tobacco dependence treatment into programs (HIV, MCH, TB, etc.) to leverage funding from existing activities.
- Develop an alliance to advocate for Article 26; and
- Advocate with WHO FCTC parties to establish strong mechanisms for identifying countries' needs for support.

2.4.4. Fostering inter-sectoral co-ordination

Collaboration with civil society groups championing issues worsened by tobacco (e.g., those concerned with food security, deforestation, women's rights, child labor, and workers' rights) can broaden the base of support for tobacco control and facilitate engagement with non-health ministries, and can also teach new approaches and strategies to the tobacco control community.

Article 5.2 of the WHO FCTC calls for the establishment of a national coordinating mechanism to align FCTC implementation across all sectors. Civil society groups can advocate for the formation of such a mechanism and participate in it when it is formed. In the absence of a formal mechanism they can serve as conveners, working to bring together non-health ministries that are key to tobacco control and engage them in its support, promoting the "Health in All Policies (HiAP) approach" aiming to integrate consideration of health impact into policymaking across sectors.

2.4.5. Strengthening health-system capacity to treat tobacco dependence

When complementing population-level tobacco control, health system intervention to help tobacco users quit can considerably reduce the burden of tobacco-related death and disease in the short and medium term. The World Health Organization recommends tobacco dependence treatment as part of the comprehensive package of essential primary care services for the prevention and

control of NCDs for low-resource settings (PEN package). Article 14 Guidelines recommend that countries aim to develop a comprehensive system offering a range of interventions for tobacco cessation and tobacco dependence treatment, but for those countries with limited resources, it urges a stepwise approach prioritizing brief advice on cessation across primary care, using existing resources and infrastructure.

Changing health systems requires the collaboration of health policymakers, health administrators and all levels of health-care providers, as well as the government and private sectors.

2.4.6. Engaging communities and the private sector

For a policy to have a sustainable impact it must develop a strong foundation within established norms and practices. Community groups and private sector organizations play an important role in developing and reinforcing key norms and practices, monitoring enforcement and compliance with policies, raising awareness, funding activities, developing innovative solutions, and delivering health services or making them more accessible and affordable.

Many companies, for example, implement 100% smoke-free policy and provide cessation support for workers as part of workplace wellness and employee health services; some fund quit lines. The pharmaceutical industry has a role in research and improving accessibility and affordability of treatment for tobacco dependence. Healthcare institutions and insurance companies can work together to expand coverage of tobacco dependence treatment options. Community groups can raise awareness of the dangers of tobacco use and SHS exposure, provide cessation counselling and support quit lines, and mobilize community support for tobacco control policies and smoke-free homes.

The private sector and community groups also have a role in delegitimizing the tobacco industry. Universities and other research entities can adopt policies against accepting tobacco industry funding. Public relations and marketing companies can refuse to accept the tobacco industry and its front groups as clients. Charitable and community organizations can refuse tobacco industry donations and sponsorship and monitor and expose tobacco industry tactics.

In addition, the media has considerable influence on both policymakers and the public; it can support enactment of tobacco control policy and help change the perceptions and norms that underlie its effectiveness.

2.4.7. Mobilizing health communities

Some of the most important voices for changing health policy and health systems are the people who are most affected by the consequences of their failure. People who have CVD, or whose lives have been altered by the CVD of family members and friends can be powerful advocates in their professional, civic and social roles. Politicians listen closely to constituents, and different sectors of the population are often most influenced by the people that they identify as peers.

Healthcare workers also are key stakeholders in tobacco control. In many countries, physicians, including cardiologists, have led national action in tobacco control. Health professional societies have also been important forces lobbying for tobacco control, raising public awareness, funding research and advocacy activities and integrating treatment for tobacco dependence into clinical practice.

2.4.8. Going beyond the WHO FCTC

Some countries have developed visions for tobacco-free societies. Finland was the first country to declare the goal of being tobacco-free by 2040. Since then Ireland and New Zealand have made plans to be tobacco-free by 2025, and in 2013 health ministers in the Pacific Island States adopted a similar target.

3. CONCLUSIONS

The tobacco epidemic claims nearly 6 million lives each year. All of these deaths are preventable and many of them are caused by CVD. The WHF Tobacco Roadmap indicates the route to better heart health through effective tobacco control, calling on different sectors and groups to support comprehensive tobacco control policy, as one of the most feasible and cost-effective ways to reduce premature CVD mortality.

Based on the global tobacco control treaty, the Framework Convention on Tobacco Control, and the guidelines governments have developed for implementing its key provisions, the WHF Roadmap identifies roadblocks to reducing tobacco use and smoke exposure, and indicates the policies and practices that are designed to bypass them. It also charts barriers to putting those policies into place, pointing out ways to overcome them.

Aiming to reduce the prevalence of tobacco use by 30% and end exposure to SHS, the Roadmap can guide coordinated multi-sectoral action to support tobacco control policies that meet the obligations of the WHO FCTC, and are aligned with its guidelines. To be successful, tobacco control policies depend on the engagement and support of disciplines well beyond the health sector. These include, among others, those working in finance, trade, agriculture, communication and education.

The Roadmap offers a tool for reviewing tobacco control strategy at regional and national levels. By focusing on the gaps in policy and implementation and opportunities for filling the gaps, stakeholders can tailor the Roadmap to local circumstances and capacities and use it to develop coordinated multi-sectoral action that changes the policies, practices, and perceptions that influence tobacco use.

ACKNOWLEDGMENTS

We would like to thank Robert Beaglehole, Geoff Fong, Judith MacKay, Francis Thompson, Yvona Tous, Judith Watt, Anca Toma Friedlander and Tibor Szilagyi for providing excellent comments on the paper. We would also like to thank World Heart Federation members and partners who provided feedback through the Roadmap development.

REFERENCES

1. World Health Organization. Second report of committee A. A65/54. Available at: http://apps.who.int/gb/ebwha/pdf_files/WHA65/A65_54-en.pdf. Accessed April 2, 2015.
2. World Health Organization. WHO global report: mortality attributable to tobacco. Available at: http://whqlibdoc.who.int/publications/2012/9789241564434_eng.pdf. Accessed April 2, 2015.
3. WHO Framework Convention on Tobacco Control. Available at: http://www.who.int/fctc/text_download/en/. Accessed April 2, 2015.
4. Contribution of six risk factors to achieving the 25×25 non-communicable disease mortality reduction target: a modelling study. http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(14)60616-4/abstract.
5. Tobacco smoking and all-cause mortality in a large Australian cohort study: findings from a mature epidemic with current low smoking prevalence. http://www.biomedcentral.com/1741-7015/13/38/abstract.
6. Institute for Health Metrics. Global burden of disease cause patterns. Available at: http://vizhub.healthdata.org/gbd-cause-patterns/. Accessed April 2, 2015.
7. WHO global report on trends in tobacco smoking 2000-2025. http://who.int/tobacco/publications/surveillance/reportontrendstobaccosmoking/en/.
8. U.S. Department of Health and Human Services (USDHHS). 2010 Surgeon General's report — how tobacco smoke causes disease: the biology and behavioral basis for smoking-attributable disease. Available at: http://www.cdc.gov/tobacco/data_statistics/sgr/2010/index.htm?s_cid=cs_1843. Accessed April 2, 2015.
9. U.S. Department of Health and Human Services (USDHHS). 2014. The health consequences of smoking — 50 years of progress: a report of the Surgeon General, 2014. Available at: http://www.surgeongeneral.gov/library/reports/50-years-of-progress. Accessed April 2, 2015.
10. Pipe A, Eisenberg MJ, Gupta A, et al. Society position statement: smoking cessation and the cardiovascular specialist: Canadian Cardiovascular Society position paper. Can J Cardiol 2011;27:132–7.
11. Van Spall HG, Chong A, Chu JV. Inpatient smoking-cessation counseling and all-cause mortality in patients with acute myocardial infarction. Am J Public Health 2007;154:213–20.
12. World Health Organization. Conference of the Parties of the Framework Convention on Tobacco Control. Control and prevention of waterpipe tobacco products. Available at: http://apps.who.int/gb/fctc/PDF/cop6/FCTC_COP6%2810%29-en.pdf. Accessed April 2, 2015.
13. Cancer Council Victoria. Tobacco in Australia: facts & issues: a comprehensive online resource. Available at: http://www.tobaccoinaustralia.org.au/downloads/chapters/Introduction.pdf. Accessed April 2, 2015.
14. Khurana M, Sharma D, Khandelwal PD. Lipid profile in smokers and tobacco chewers — a comparative study. J Assoc Physicians India 2000;48:895–7.
15. Oberg M, Jaakkola MS, Woodward A, Peruga A, Prüss-Ustün A. Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. Lancet 2011;377:139–46.
16. U.S. Department of Health and Human Services (USDHHS). The health consequences of involuntary exposure to tobacco smoke. A report of the Surgeon General. Available at: http://www.surgeongeneral.gov/library/reports/secondhandsmoke/secondhandsmoke.pdf. Accessed April 2, 2015.
17. Barnoya J, Glantz SA. Cardiovascular effects of secondhand smoke: nearly as large as smoking. Circulation 2005;111:2684–98.
18. Institute of Medicine. Secondhand smoke exposure and cardiovascular effects: making sense of the evidence. Washington DC, USA: The National Academies Press; 2010.
19. U.S. Department of Health and Human Services (USDHHS). 2006. http://www.ncbi.nlm.nih.gov/books/NBK44324/.
20. World Health Organization. International statistical classification of diseases and related health problems. 10th revision (ICD-10). Available at: http://www.who.int/classifications/icd/ICD10Volume2_en_2010.pdf. Accessed April 2, 2015.
21. United Nations General Assembly. Resolution A/RES/66/2: Political declaration of the High-Level Meeting of the General Assembly on the Prevention and Control of Noncommunicable Diseases. Available at: http://who.int/nmh/events/un_ncd_summit2011/political_declaration_en.pdf. Accessed April 2, 2015.
22. National Cancer Institute. The role of the media in promoting and reducing tobacco use. Tobacco Control Monograph No. 19. Available at: http://cancercontrol.cancer.gov/brp/tcrb/monographs/19/m19_complete.pdf. Accessed April 2, 2015.
23. Australian Government. Department of Health. Tobacco plain packaging factsheet. Available at: http://health.gov.au/internet/main/publishing.nsf/. Accessed April 2, 2015.
24. International Tobacco Control Policy Evaluation Project, World Health Organization, and World Heart Foundation. Cardiovascular harms of tobacco use and secondhand smoke: global gaps in awareness and implications for action. Available at: http://www.who.int/tobacco/publications/surveillance/cardiovascular_harms_from_tobacco_use.pdf. Accessed April 2, 2015.
25. Levy DT, Ellis JA, Mays D, Huang AT. Smoking-attributable deaths averted due to three years of policy progress. Bull World Health Organ 2013;91:509–18.
26. WHO report on the global tobacco epidemic 2013. Enforcing bans on tobacco advertising, promotion and sponsorship. http://www.who.int/tobacco/global_report/2013/en/.
27. Global trends and projections for tobacco use, 1990—2025: an analysis of smoking indicators from the WHO Comprehensive Information Systems for Tobacco Control. http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(15)60264-1.pdf.
28. The impact of smoke-free legislation on smoking-related emergency admissions in Istanbul. http://erj.ersjournals.com/content/38/Suppl_55/4698.short.
29. Abascal W, Esteves E, Goja B, et al. Tobacco control campaign in Uruguay: a population-based trend analysis. Lancet 2012;380:1575–82.
30. Kostova D, Andes L, Erguder T, et al. Cigarette prices and smoking prevalence after a tobacco tax increase — Turkey, 2008 and 2012. MMWR Morb Mortal Wkly Rep 2014;63:457–61.
31. World Health Organization. Five years of progress in global tobacco control. Available at: http://www.who.int/tobacco/global_report/2013/five_years_progress.pdf?ua=1. Accessed April 2, 2015.
32. Venegas J, Uruguayan Minister of Health. Cited in the International Tobacco Control Policy Evaluation Project; ITC Uruguay National Report. Available at: http://www.itcproject.org/files/ITC_Uruguay_NR-Aug8-web-v2.pdf. Accessed April 2, 2015.
33. Chaloupka F, Hu T, Warner KE, Jacobs R, Yurekli A. The taxation of tobacco products. In: Jha P, Chaloupka F, editors. Tobacco control in developing countries. New York, NY, USA: Oxford University Press; 2000.
34. WHO. "Sin Tax" expands health coverage in the Philippines. http://www.who.int/features/2015/ncd-philippines/en/. Accessed June 16, 2015.
35. Cancer Council Australia. Plain packs will stop kids from smoking. Available at: http://www.cancer.org.au/news/media-releases/media-releases-2011/plain-packs-will-stop-kids-smoking.html. Accessed April 2, 2015.
36. Lightwood JM, Glantz SA. Declines in acute myocardial infarction after smoke-free laws and individual risk attributable to secondhand smoke. Circulation 2009;120:1373–9.

37. Wakefield MA, Durkin S, Spittal MJ, et al. Impact of tobacco control policies and mass media campaigns on monthly adult smoking prevalence. Am J Public Health 2008;98:1443–50.
38. Wakefield MA, Loken B, Hornik RC. Use of mass media campaigns to change health behavior. Lancet 2010;376:1261–71.
39. Wakefield MA, Coomber K, Durkin SJ, et al. Time series analysis of the impact of tobacco control policies on smoking prevalence among Australian adults, 2001—2011. Bull World Health Org 2014;92: 413–22.
40. Emery S, Kim Y, Choi YK, Sczpzypka G, Wakefield M, Chaloupka FJ. The effects of smoking-related advertising on smoking and intentions to quit among adults in the United States, 1999—2007. Am J Public Health 2012;102:751–7.
41. Hammond D, Fong GT, McDonald PW, Cameron R, Brown KS. Impact of graphic Canadian warning labels on adult smoking behavior. Tob Control 2003;12:391–5.
42. Borland R, Yong HH, Wilson N, et al. How reactions to cigarette packet health warnings influence quitting: findings from the ITC Four-Country Survey. Addiction 2009;104:669–75.
43. Partos TR, Borland R, Yong HH, Thrasher J, Hammond D. Cigarette packet warning labels can prevent relapse: findings from the ITTC 4-country policy evaluation cohort study. Tob Control 2013;22: e43–50.
44. CREATEC + Market studies. Effectiveness of health warning messages on cigarette packages in informing less-literate smokers, final report. Prepared for Communications Canada 64, 2003.
45. Millar WJ. Reaching smokers with lower educational attainment. Health Rep 1996;8:11–9.
46. Siahpush M, McNeill A, Hammond D, Fong GT. Socioeconomic and country variations in knowledge of health risks of tobacco smoking and toxic constituents of smoke: results from the 2002 ITC Four Country Survey. Tob Control 2006;15(suppl 3):iii65–70.
47. Cotter T, Perez D, Dunlop S, Hung WT, Dessaix A, Bishop JF. The case for recycling and adapting anti-tobacco mass media campaigns. Tob Control 2010;19:514–7.
48. Aveyard P, Begh R, Parsons A, West R. Brief opportunistic smoking cessation interventions: a systematic review and meta-analysis to compare advice to quit and offer of assistance. Addiction 2012;107: 1066–73.
49. World Health Organization. Framework Convention on Tobacco Control. Guidelines for implementation of Article 14. Guidelines on demand reduction measures concerning tobacco dependence and cessation. Available at: http://www.who.int/fctc/guidelines/adopted/article_14/en/. Accessed April 2, 2015.
50. Raw M, McNeill A, Murray R. Case studies of tobacco dependence treatment in Brazil, England, India, South Africa and Uruguay. Addiction 2010;105:1721–8.
51. WHO Global Progress Reports. Available at: http://www.who.int/fctc/reporting/2014globalprogressreport.pdf?ua=1. Accessed June 29, 2015.
52. World Health Organization. Framework Convention on Tobacco Control. Parties to the WHO Framework Convention on Tobacco Control. Available at: http://www.who.int/fctc/signatories_parties/en/. Accessed April 2, 2015.
53. World Health Organization. WHO report on the global tobacco epidemic, 2011. Available at: http://www.who.int/tobacco/global_report/2011/en/. Accessed April 2, 2015.
54. Nugent RA, Feigl AB. Where have all the dollars gone? Scarce donor funding for non-communicable diseases. Center for Global Development. Working Paper 228. Available at: http://www.cgdev.org/files/1424546_file_Nugent_Feigl_NCD_FINAL.pdf. Accessed April 2, 2015.