



## Editorial

## Noncommunicable Disease Risk Factors in Developing Countries: Policy Perspectives



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Following advances in infectious disease control, noncommunicable diseases (NCDs) have overtaken other conditions as causes of premature death and disability in lower-income nations. The largest portion of the NCD burden in low- and middle-income countries (LMICs) is represented by cardiovascular diseases (CVD), followed by cancer, diabetes and chronic respiratory disease (World Health Organization, 2016). Although NCDs are often considered to be diseases of ageing, the NCD crisis in developing countries does not appear to be explained solely by longer life spans; the growth in NCD deaths and disability in these countries has occurred at a faster rate than the contemporaneous decline in communicable diseases (Stuckler, 2008). Specific circumstances that worsen NCD outcomes in LMICs relative to high-income countries are the timing of disease onset and the level of treatment after onset. NCDs in LMICs tend to occur earlier in life (WHO, 2016; Institute for Health Metrics and Evaluation, 2013), and may not receive adequate treatment once they occur (Cameron et al., 2011). Health systems in LMICs may not be equipped to address the needs of the chronically ill, and long-term treatment may not be accessible. This adverse combination of factors results in NCD outcomes that have broad societal, economic, and health security consequences in developing countries. Recognizing the role of NCDs as an impediment to international development, the 2030 Agenda for Sustainable Development has identified the reduction in premature NCD mortality among its primary targets (United Nations, 2015).

It is not merely NCD mortality but the disproportionate *prematurity* of NCDs that has come to define NCD-related disparities in LMICs. In contrast to high-income countries, the majority of NCD deaths in developing countries occur before age 70 (WHO, 2016). The proportion of NCD mortality presenting in persons younger than 60 is 44% in low-income countries – nearly quadruple the rate of 12% in high-income countries (WHO, 2016). The prematurity of NCD complications in developing countries may contribute to perpetuating the cycle of poverty at the individual level, and to impeding economic development at the macro level (Bloom et al., 2011). Inadequate attention to NCDs in LMICs may further compound the negative effects of communicable illnesses, in clinical as well as economic ways. From a clinical perspective, NCDs and NCD risk factors have been shown to interfere with infectious disease control by increasing susceptibility to certain infections (Bagaitkar et al., 2008; Remais et al., 2013; Crevel et al., 2017). From an economic perspective, the added strain on health systems from rising and poorly controlled chronic illnesses (Heymann et al., 2015) can crowd out resources for dealing with existing and/or emerging infections. The worldwide epidemiological shift from infectious diseases to NCDs has increased the relevance of NCD initiatives to global health security. As the provision of NCD services becomes a foundational component of health delivery systems, global health security elements such as emergency outbreak response can be contingent on NCD-based health infrastructure. Efforts to control communicable diseases and NCDs in developing countries intersect by sharing health systems, risk factors, and target populations; recognizing the significance of these overlaps can increase the efficiency of efforts to improve health security globally (Kostova et al., 2017).

A critical approach for addressing NCDs, particularly in LMICs with limited clinical capacity, is NCD prevention through policies that reduce unhealthy behaviors and risk factors such as tobacco use and obesity. Since tobacco use is implicated in all leading NCDs including CVD, cancer, and pulmonary disease, population-level strategies to discourage this behavior are top priorities for public health policy. Such strategies include tobacco taxes high enough to increase prices, regulatory measures including smoke-free public places, compelling anti-tobacco messaging, and marketing restrictions. Increasing the prices of tobacco products through taxation is the least costly and most cost-effective tobacco use intervention in LMICs (Asaria et al., 2007; U.S. National Cancer Institute and World Health Organization, 2016). The demonstrated success of tobacco taxes in reducing consumption across multiple geographies has helped tobacco tax policy become a key approach to NCD risk prevention. In recent years, as excessive

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sugar consumption has received increased attention as a potential contributor to obesity, taxes on sugary beverages may be considered in a similar fashion. Although these so-called “soda taxes” are not yet widely used, they have been implemented in a number of countries and US cities, and are a central part of the NCD control toolkit of the World Health Organization (World Health Organization, 2015a).

The collection of articles in the special issue titled “Noncommunicable Disease Risk Factors in Developing Countries: Policy Perspectives” discusses aspects of policies that can influence NCD risk factors in LMICs. As the leading behavioral risk factor for NCDs, tobacco use is the subject of a number of articles in the collection. Husain et al. (Husain et al., 2017) examine the aftermath of a recent tobacco tax increase in Thailand, where a post-tax reduction in smoking rates was much anticipated but failed to occur. The study finds evidence of two potential reasons that may have helped to attenuate the tax initiative's intended effect: the consumption of cigarettes in Thailand shifted to lower-priced brands following the tax increase, and the affordability of cigarettes was not reduced by the tax increase due to concurrent rising incomes in the country. The relevance of these findings is in highlighting areas where tobacco tax policy can be strengthened - specifically, by ensuring that a tax increase is large enough to outpace income growth and thus reduce affordability, and by structuring the tax - for example, using specific rather than ad-valorem taxes - to reduce incentives for brand down-switching. In a separate study, Ngo et al. (Ngo et al., 2017) use data from 50 countries to evaluate the link between aggregate smoking levels and a comprehensive package of tobacco control policies that include but are not limited to tobacco taxation. The significant association between smoking reduction and the presence of a diverse tobacco control strategy, as the one outlined in the WHO MPOWER technical package (World Health Organization, 2017a) and the WHO Framework Convention on Tobacco Control (FCTC) (World Health Organization, 2015b), supports the argument for a comprehensive approach to tobacco control.

Other topics relevant to the effectiveness of tobacco control initiatives, such as illicit cigarette trade and tobacco industry strategies in response to tax policy - are discussed in Ross (Ross, 2017) and Ross et al. (Ross et al., 2017). Illicit trade undermines the goals of tobacco tax policy through tax evasion. A range of measures to manage this issue has been outlined in the Protocol to Eliminate Illicit Trade in Tobacco Products (World Health Organization, 2015c) as part of the WHO FCTC. Ross (2017) documents a recent program to curb illicit cigarette trade in Kenya using a track-and-trace system - a technology-based platform that records the movement of tobacco products along the supply chain and ensures compliance with tax and distribution laws. These systems have been shown to be effective in reducing tax evasion in high-income countries, but can be viewed as too resource-intensive for lower-income countries. Ross (2017) informs about the context and challenges of implementing such a system in Kenya, and offers early evidence of increased tax revenue for the country's revenue authority, demonstrating that track-and-trace systems can be implemented in a cost-effective manner in lower-income countries. The article helps to highlight tax evasion as a governance and enforcement issue, underscoring that illicit trade in itself may not be considered as a relevant argument against raising tobacco taxes. Other contextual considerations in tobacco tax policy - namely, tobacco supply-side reactions that may counteract the intended effect of taxation - are described by Ross et al. (2017). Using specific examples from developing countries, the authors offer a summary of possible industry responses to tax increases, which can help keep policymakers a step ahead when devising tobacco tax policy.

Another line of research presented in this special issue relates to the increasingly obesogenic environment in many LMICs. Sugary drinks have emerged as likely culprits for obesity, positioning taxing of these products as a possible means for discouraging their consumption at the population level (Brownell and Frieden, 2009). Tax increases will have the intended consumption effect only if they are successful in raising retail prices, so evaluating how prices change after a tax increase is an important first step in the process of understanding the effects of tax policy. One of the most recent examples of implementing a national tax on sugar-sweetened beverages comes from the 2015 sugary-drink tax in Barbados. Using super-market sales data, Alvarado et al. (Alvarado et al., 2017) review early evidence on tax-related changes in the Barbados beverage market, describing accelerated post-tax growth in the prices of sugar-sweetened beverages relative to unsweetened beverages. The taxation of sugary drinks is increasingly considered by policymakers in other geographies as well, motivating research targeted at locations where such policies are under discussion. To this end, Stacey et al. (Stacey et al., 2017a) present evidence from South Africa on the potential effect of sugary-drink taxes on consumption by estimating price elasticities of sugary drinks. Stacey et al. (Stacey et al., 2017b) explore the market for a sub-category of sugary beverages, energy drinks, and its link to television advertising in South Africa, illustrating the possible role of advertising in the consumption of excess sugar in the country.

Mexico's 2014 introduction of a tax on calorie-dense foods and sugary drinks is a source of growing evidence on the effects of food tax policy in LMICs. In the course of investigating food consumption patterns in Mexico following the tax, Taillie et al. (2017) discuss policy-relevant implications including evidence of potential time lags in the tax effect, and evaluate the tax effect on the consumption choices in its principal target group of high-calorie food purchasers. An important economic aspect of Mexico's 2014 food tax policy - the policy's possible employment effects - is examined in Guerrero-Lopez et al. (Guerrero-López et al., 2017), where the policy was not found to have detrimental effects on employment. A similar conclusion in a different geographical context is reached in Wada et al. (Wada et al., 2017), who examine the employment effects of tax increases on alcoholic beverages in the United States and find no evidence of tax-associated job losses, instead estimating that there would be small net increases in jobs in states that raise their alcohol taxes.

While most of the articles in this special issue discuss aspects of policies related to NCD risk factor modification, aspects of disease management were also examined. Using a benefit-cost framework, Nugent et al. (2017) project the potential outcomes of a national program for clinical hypertension management in Bangladesh. Bangladesh is a populous low-income country where primary NCD risks like hypertension tend to go unrecognized and untreated. Nugent et al. estimate that net economic benefits would occur within 6 years of establishing such a program, highlighting the space for improving health outcomes through hypertension control in Bangladesh.

Alongside policy initiatives, clinical programs that streamline and strengthen the management of NCDs represent complementary avenues for improving health outcomes in LMICs. The World Health Organization has identified a number of cost-effective interventions that are particularly suitable for application in LMICs (World Health Organization, 2017b). These include population-level actions on tobacco use, excessive alcohol use, unhealthy diets, and physical activity, as well as patient-level actions to control cardiovascular disease, diabetes, and some cancers. Similarly, the World Bank has supported policy reforms to facilitate behavioral change in LMICs, including policies on food labeling, advertising of unhealthy products, and artificial trans-fat use. Through its diversified portfolio of health system and health financing operations, the World Bank Group has focused a number of projects on NCD risk reduction through primary-care and community-driven interventions (World Bank, 2014, 2010). Because policy approaches to reduce the major NCD risk factors (tobacco use, harmful use of alcohol, unhealthy diets, physical inactivity) often lie within non-health sectors, collaboration across all of government is fundamentally important for NCD risk reduction (World Health Organization, 2017c). Within the whole-society framework for NCD prevention and control, this special issue in *Preventive Medicine* continues the dialogue necessary to establish optimal ways for improving public health globally.

## Disclaimers

The views and conclusions in this article are those of the authors and do not necessarily represent the views and positions of the institutions with which they are affiliated.

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## Conflicts of interest

None.

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