



The impact and relevance of tobacco control research in low-and middle-income countries globally and to the US



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ABSTRACT

International and cross-cultural research is critical for understanding multilevel influences on health, health behaviors, and disease. A particularly relevant area of need for such research is tobacco control. The tobacco epidemic is one of the biggest public health threats globally, killing over 7 million people a year. Research critical to addressing this public health problem has leveraged variability in tobacco use, history, product market, and policies across different countries, settings, and populations, particularly in low- and middle-income countries (LMICs) where the tobacco burden is increasing. These efforts are needed in order to advance the science and inform practice and policy in various settings, including the US. Several funding agencies provide support for international research focused on tobacco control in LMICs because of the importance and implications of such research. This paper provides some concrete examples of how such research has advanced our knowledge-base and informed practice and policy globally, particularly in high-income countries including the US. Some prominent themes emphasized in this manuscript include: the development of knowledge regarding the diverse tobacco products on the market; better understanding of tobacco use and its impact among different populations; generating knowledge about the impacts including unintended consequences of tobacco control policy interventions; and better understanding tobacco industry strategies and informing advocacy efforts. In summary, international tobacco control research, particularly in LMICs, is critical in effectively and efficiently building the evidence base to advance tobacco control research, policy, and practice globally, including the US, with the ultimate goal of curbing the tobacco epidemic.

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1. Introduction

The tobacco epidemic is one of the biggest public health threats globally, killing more than 7 million people a year, with tobacco-related morbidity and mortality increasingly burdening low- and middle-income countries (LMICs). (World Health Organization, 2015a). Recent literature has underscored the importance of international health research (Glass, 2013; Greenwald & Dunn, 2009; Maziak, 2017) and international tobacco control research specifically, (Maziak, 2017; Parascandola & Bloch, 2016) as variability at the macro levels (e.g., policy, social, environmental) is critical for estimating the influence of these factors on health. (Glass, 2013; Greenwald & Dunn, 2009; McLeroy, Bibeau, Steckler, & Glanz, 1988). In the context of tobacco control, the variability in macro-level factors globally, particularly differences in tobacco control in LMICs versus high-income countries (HICs), has provided strategic opportunities for research examining multilevel influences on tobacco use behavior and related disease. (Glass, 2013; Greenwald & Dunn, 2009). Consideration of factors such as understanding where health risk behaviors and related diseases are most prevalent (or, in some cases, absent) may advance our knowledge regarding mechanisms and risk factors. (Glass, 2013; Greenwald & Dunn, 2009). In addition, because of increased migration and globalization of the tobacco product market, it is important to understand tobacco products and patterns of use in parts of the world where they are prominent in order to advance knowledge to inform other communities as product markets expand. Moreover, a broad range of evidence-based measures for tobacco control are being implemented globally in different ways across diverse settings, allowing estimations of policy impact and the factors that influence them.

Several funding agencies provide support for research in different countries or across countries, particularly LMICs. For example, the Fogarty International Center (FIC) at the US National Institutes of Health (NIH) has provided support for research training programs related to various public health initiatives in LMICs for over 50 years, now extending to more than 100 countries. (NIH Fogarty International Center, 2017). In 2002, FIC and its partners awarded the first International Tobacco and Health Research and Capacity Building Program (TOBAC) grants, all of which involved collaborations with institutions and scientists in LMICs. This entity and other key funding institutions, including the Bill & Melinda Gates Foundation, the American Cancer Society, Cancer Research UK, the Bloomberg Initiative to Reduce Tobacco Use, and Canada's International Development Research Centre, as well as efforts such as the Global Tobacco Surveillance System, have been critical in developing and supporting globally relevant tobacco control research, with a major focus being developing research capacity in LMICs in order to advance the evidence base for tobacco control globally, including the US.

This review aims to provide some concrete examples of how such research in LMICs has advanced tobacco control practice and policy globally, with a particular focus on the impact on US tobacco control efforts. Some prominent themes emphasized in this manuscript include: the development of knowledge regarding the diverse tobacco products on the market; better understanding of tobacco use and its impact among different populations; generating knowledge about the impacts of tobacco control policy interventions; and better understanding of tobacco industry strategies in order to inform advocacy efforts (Table 1).

2. Diversity of tobacco products

International tobacco research is particularly relevant today with the expansion of tobacco product offerings, which has, in some cases, outpaced development of an evidence-base regarding their health effects. Understanding such differences in nicotine delivery and exposure across products is critical in developing effective interventions, both in local contexts and beyond those in which they are studied. (Maziak, Eissenberg, & Ward, 2005; Stanfill, Connolly, Zhang, et al., 2011).

2.1. Waterpipe/Hookah

Historically, waterpipe tobacco smoking had been too rare to be a public health priority outside of the Eastern Mediterranean Region. (World Health Organization, 2015b). However, in more recent years, waterpipe use has become increasingly popular among youth globally. (Maziak, Taleb, Bahelah, et al., 2015). Research conducted in the Eastern Mediterranean Region has been integral in developing our knowledge base regarding waterpipe smoking, highly applicable to understanding its use in the US and globally. For example, the Syrian Center for Tobacco Studies and the American University of Beirut have made valuable contributions to the literature regarding the epidemiology of waterpipe use, how to structure surveillance measures for waterpipe smoking based on its unique use patterns, its toxic and addictive properties, measurement methods for assessing waterpipe smoking topography, and recommendations on policies and regulations. (Al Ali, Rastam, Ibrahim, et al., 2015; Asfar, Ward, Al-Ali, & Maziak, 2016; Salloum, Asfar, & Maziak, 2016; Shihadeh, Antonios, & Azar, 2005; World Health Organization, 2015b; World Health Organization, 2018a; World Health Organization, 2018b). These prior research efforts advanced the science regarding waterpipe smoking, guiding other countries such as the US in how to respond to the waterpipe epidemic. (Maziak, 2017).

2.2. Smokeless tobacco

Smokeless tobacco use in the US is relatively low overall (~3%) but is much higher among some subgroups (e.g., young rural males). (Agaku & Alpert, 2015). On a global scale, the greatest disease burden from smokeless tobacco use occurs in LMICs. (National Cancer Institute and Centers for Disease Control and Prevention, 2014). Thus, data derived from countries with high numbers of exclusive smokeless tobacco users, such as India, have been critical to characterizing the impact of smokeless tobacco use on cancer, oral lesions, adverse reproductive outcomes, and other effects. (Agaku, Filippidis, Vardavas, et al., 2014; Berg, Ajay, Ali, et al., 2015). In fact, research has documented higher risks ratios for smokeless tobacco products used in the Indian subcontinent than in America. (Asthana, Labani, Kailash, Sinha, & Mehrotra, 2018). India has implemented some novel policies and interventions targeting smokeless tobacco use, including bans on some product types (i.e., gutka), graphic warning labels, and national media campaigns. (National Cancer Institute and Centers for Disease Control and Prevention, 2014). Experience and data from countries heavily impacted by smokeless tobacco use can advance the science in other countries, including HICs such as the US.

3. Populations & settings

The literature regarding cultural, racial, and ethnic differences in tobacco use and related disease can also be informed by research in LMICs.

3.1. Low-income populations/settings

Research in HICs has documented that tobacco use prevalence, as well as exposure to tobacco products and tobacco smoke, is increasingly concentrated in populations of low education, with racial/ethnic differences in patterns and cessation rates. (Drope et al., 2018). Within LMICs, lower income is usually associated with increased tobacco use prevalence as well, (World Health Organization, 2014) providing opportunities to further understand the complexities of tobacco use prevention and cessation in low-income groups in HICs, including the US. For example, Project Quit Tobacco International in India and Indonesia gained considerable insight into developing and disseminating effective tobacco cessation treatment in low-resource settings, particularly by integrating tobacco treatment into medical and nursing educational

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