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Editorial: 5th Special Issue on behavior change, health, and health disparities

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Abstract

This Special Issue of *Preventive Medicine (PM)* is the 5th in a series on behavior change, health, and health disparities. Unhealthy behavior patterns (i.e., lifestyle choices) including cigarette smoking and other substance abuse, physical inactivity, unhealthy food choices, and non-adherence with recommended medical regimens, undermine U.S. population health by increasing risk for chronic disease and premature death. This Special Issue brings together scholarly contributions from the emerging area of tobacco regulatory science to examine current topics of critical importance to reducing the burden of cigarette smoking on U.S. population health. More specifically, three related topics are examined including (a) the potential for reducing smoking by adopting a national policy that would cap the nicotine content of cigarettes at minimally-addictive levels; (b) increasing scientific understanding of cigarette smoking and other tobacco use among populations that are especially vulnerable to initiating smoking, tobacco addiction, and its adverse health consequences; and (c) the potential of a harm-reduction strategy for reducing the burden of smoking by advocating that those who are unwilling or unable to quit nicotine use substitute electronic cigarettes or other non-combusted sources of nicotine for cigarettes in order to avoid exposure to the other toxins in tobacco smoke that are most responsible for smoking morbidity and mortality. While tremendous progress has been made in reducing overall U.S. smoking prevalence and its adverse health impacts, more needs to be done. This Special Issue offers some ideas that have the potential to make a substantive contribution towards that goal.

Keywords

Tobacco regulatory science; Cigarette smoking; Reduced nicotine content cigarettes; Vulnerable populations; E-cigarettes; Harm reduction

1. Introduction

This Special Issue of *Preventive Medicine (PM)* is the 5th in a series that focuses on behavior change, health, and health disparities. The four prior Special Issues appeared in the November issue each year and are available online: 2014 (<http://www.sciencedirect.com/science/journal/00917435/68/suppl/C>), 2015 (<http://www.sciencedirect.com/science/journal/>

Conflicts of Interest

I have no conflicts to declare.

00917435/80) 2016 (<http://www.sciencedirect.com/science/journal/00917435/92?sd=1>) and 2017 (<https://www.sciencedirect.com/journal/preventive-medicine/vol/104>). Contributors to these Special Issues are selected from among participants in the annual conferences on Behavior Change, Health, and Health Disparities that are organized by the Vermont Center on Behavior and Health (VCBH), a National Institutes of Health (NIH) and Food and Drug Administration (FDA) supported center of biomedical research excellence located at the University of Vermont (<http://www.med.uvm.edu/behaviorandhealth/home>). This select subset of conferees was invited to contribute to this 5th Special Issue because of their exemplary scholarship and outstanding conference presentations. Each contribution underwent thorough peer review overseen by the Editor-in-Chief in coordination with me acting in the role of Guest Editor. Below I comment briefly on the rationales for organizing these annual conferences and associated publications

2. The Challenge of Unhealthy Lifestyles, Chronic Disease and Premature Death, and U.S. Population Health

There is broad scientific consensus that unhealthy behavior patterns (i.e., lifestyle choices) including cigarette smoking and other substance abuse, physical inactivity, overconsumption of unhealthy foods, and non-adherence with recommended medical regimens increase risk for chronic disease and premature death. The high prevalence and persistence of these unhealthy behavior patterns is a major reason why U.S. population health continues to lag so far behind that of most other developed nations. Their overrepresentation and disproportionate adverse health impacts among certain subpopulations (e.g., socioeconomically disadvantaged populations, certain racial/ethnic and sexual/gender minority groups, and individuals with mental illness or other substance use disorders) is a major contributor to the growing problem of U.S. health disparities (Higgins, 2014; 2015; Schroeder, 2016).

One unhealthy behavior pattern that stands above all others in terms of longstanding and devastating impact on individual and population health is cigarette smoking. Indeed, the striking annual premature death rate in the U.S. attributable to cigarette smoking (> 480,000) is becoming so familiar that there is risk of becoming desensitized to it (Centers for Disease Control, 2018). Perhaps even more concerning is the risk that the dark cloud of that statistic will obscure the tremendous progress that has been made in reducing U.S. smoking prevalence by more than half since the early 1960s and the more than 8 million premature deaths that were prevented by that change. That 8-million figure was first reported in 2014 as part of celebrating the 50th anniversary of publication of the landmark 1964 report of the U.S. Surgeon General's Advisory Committee on Smoking and Health (Holford et al, 2014). Obviously, that figure underscores an enormously important and impressive public health accomplishment and the potential to change health behaviors at a scale that greatly improves population health. A point of critical relevance to this Special Issue is that this wonderful accomplishment was achieved under conditions where the federal government was without authority to regulate the manufacture, distribution, or marketing of cigarettes or other tobacco products. That was an especially peculiar state of affairs considering that cigarettes are the only commercial product sold in the U.S. where if used as directed by the

manufacturer will result in the death of 50% of long-term consumers. Fortunately that changed with passage of the 2009 Family Smoking Prevention and Tobacco Control Act, giving the U.S Food and Drug Administration (FDA) regulatory authority over tobacco products (FDA, 2018a, 2018b). With that authority in hand, and considerable associated responsibilities, the FDA established a Center for Tobacco Products (CPT) within the agency to carryout this charge while also entering into a partnership with the National Institutes of Health (NIH) establishing the Tobacco Regulatory Science Program (TRSP) to assure that CTP has the multidisciplinary scientific input necessary to conduct evidence-based regulation (Office of Disease Prevention, 2018). TRSP currently supports a rapidly growing and robust multidisciplinary extramural research portfolio.

3. Selected Topics in Tobacco Regulatory Science

The articles in this Special Issue focus largely on the critically important scientific domains of addiction and behavior. More specifically, this Special Issue focuses on a related set of three current topics in tobacco regulatory science with considerable relevance to reducing the burden of cigarette smoking on U.S. population health. First, we examine current research examining the effects of a potential national policy that would reduce the nicotine levels in cigarettes to minimally addictive levels. Early research on cigarette smoking established a sound body of experimental evidence demonstrating that nicotine was the constituent in tobacco smoke that promotes repeated use and eventual addiction by stimulating brain reward centers in a manner that is shared across addictive drugs. With that knowledge as backdrop, Neal Benowitz and Jack Henningfield made an insightful proposal in 1994 regarding the potential to reduce the addictiveness of smoking by capping the nicotine content allowable of cigarettes below an addiction threshold (Benowitz and Henningfield, 1994). The proposal is elegant in its simplicity: the reinforcing effects of nicotine and other drugs are dose-dependent. As such, it should be possible to lower the nicotine content below a threshold dose necessary to produce reinforcement, repeated use, and eventual addiction. Doing so should decrease the likelihood that youth experimenting with smoking will transition to chronic use and make it easier for established smokers to quit if they wish to do so. Although this idea was well received in scientific and medical circles, it never received a thorough evaluation scientifically due to the absence of regulatory authority over tobacco necessary to translate it into policy. That all changed with passage of the Tobacco Control Act and the FDA recently announced a Comprehensive Plan for Tobacco Regulation in which careful consideration of the Benowitz and Henningfield proposal features prominently (Gottlieb & Zeller, 2017).

Five reports in this Special Issue focus on this highly important topic of reduced nicotine content cigarettes, kicking off with a Commentary by Benowitz and Henningfield (2018, this issue) detailing their initial proposal, how it was influenced by various historical events, what has been learned scientifically about the effects of reducing the nicotine content of cigarettes over the ensuing years, and suggestions on potential market factors including availability of alternative non-combusted sources of nicotine that could moderate the impact of a national policy reducing the nicotine content of cigarettes. Smith et al. (2018, this issue) drill down on the importance of considering a potential policy reducing nicotine content of cigarettes to minimally addictive levels and the regulation of non-combusted sources of

nicotine as complementary policies wherein the impact of the former is likely to be moderated by the latter. The contributions of Higgins et al. (2018, this issue), Foulds et al. (2018, this issue), and Tidey et al. (2018, this issue) in this section each report secondary analyses of data collected in controlled experimental studies on reduced nicotine content cigarettes. The Foulds et al. report offers a methodological insight on how second-hand smoke exposure in studies of very low nicotine content cigarettes could exaggerate estimates of non-adherence, a topic of considerable importance when evaluating the internal validity of research on these cigarettes in naturalistic settings with other tobacco products readily available. The Higgins et al. and Tidey et al. reports contribute important evidence from controlled trials that reducing nicotine content in cigarettes to very low levels decreases the addiction potential of smoking even in populations with co-morbid psychiatric conditions, socioeconomic disadvantage, and more severe tobacco dependence, without producing untoward craving/withdrawal or other adverse consequences.

This topic of vulnerable populations must be considered when discussing the overarching goal of reducing the burden of cigarette smoking. Thus a considerable portion of this Special Issue is devoted to increasing scientific understanding on risk and patterns of cigarette smoking and other tobacco use among vulnerable populations. As discussed above, the impressive progress that has been made in reducing U.S. smoking prevalence has been unevenly distributed in the U.S. population, with considerable decreases evident among the more affluent and educated, but less or none among those who are socioeconomically disadvantaged, have psychiatric conditions, reside in rural regions, or are from racial/ethnic, gender, and sexual minority groups. Important to understand is that these vulnerabilities intersect producing clusters or profiles that confer especially high risk, an underresearched topic that is detailed in a Commentary by Gaalema, Leventhal, et al. (2018, this issue) regarding risk for current cigarette smoking in the U.S. adult population and more specifically in an original study by Villanti et al (2018, this issue) investigating risk factors for cigarette smoking and preference for mentholated cigarettes among U.S. young adults. Additionally, the number and variety of tobacco and nicotine-delivering products being used in vulnerable populations has increased rapidly over the last decade, introducing novel use patterns and raising important research questions and regulatory challenges. Kurti et al. (2018, this issue) and Lopez et al. (2018, this issue) provide sorely needed data from U.S. national samples of women of reproductive age, with Kurti et al. providing seminal, longitudinal data on quit rates of conventional cigarettes, e-cigarettes, and other tobacco products during pregnancy, and Lopez et al. providing valuable new information on prevalence of use of these same products among non-pregnant women of reproductive age. Cepeda-Benito et al. (2018, this issue) reports a study further delineating the growing influence of rural residence as an independent risk factor for cigarette smoking in U.S. adults, with this study underscoring a disproportionate impact among rural women. In the final contribution to this subsection on vulnerable populations, Gaalema, Pericot-Valverde, et al. (2018, this issue) provide sobering, novel longitudinal data from a U.S. nationally representative survey showing that while a recent myocardial infarction is associated with increases in perceived risk of tobacco use, it is not associated with significant increases in quitting smoking nor switching to less harmful non-combusted tobacco product substitutes.

The Gaalema, Pericot-Valverde, et al. article provides an excellent segue into the third and final section on the potential role of e-cigarettes and other non-combusted sources of nicotine as less harmful substitutes for combusted products for those who are unwilling or unable to quit nicotine use. Current scientific evidence suggests that while we do not yet know the long-term health effects of e-cigarettes they will almost surely be less harmful than conventional cigarettes and in that regard could represent a viable substitute for persistent cigarette smokers (National Academy of Sciences, 2018). This potential of e-cigarettes as a harm-reduction product is being considered in a context of enormous concern about the growing popularity of e-cigarettes among youth, a context in which recommending their use to adult cigarette smokers as a less harmful substitute may inadvertently increase their appeal among youth (FDA, 2018a, 2018b). There is also the related concern that e-cigarette use among youth may act to increase later uptake of conventional cigarette smoking even among those who otherwise would not have become smokers (National Academy of Sciences, 2018). The topic is important but also controversial. Henningfield et al. (2018, this issue) kick off this section with a Commentary discussing how the nicotine reduction strategy and e-cigarettes and other electronic nicotine delivery systems have become inextricably linked while detailing some of the history of harm reduction and tobacco use. They also entertain the possibility that individual differences around the omission bias in human decision-making may be contributing to the different camps that have emerged on this harm-reduction strategy among researchers and advocates within the tobacco field. The omission bias is a tendency for humans to weight errors of commission (e.g., advocating for a policy that promotes e-cigarette use as a less harmful substitute for cigarettes among adult smokers that inadvertently increases e-cig use among youth) more heavily, and judge them more harshly, than errors of omission (e.g., advocating against a harm-reduction policy in order to protect youth thereby inadvertently failing to reduce smoking-related morbidity/mortality among adults) (Baron & Ritov, 2004; Holtgrave, 2010). That possibility aligns well with a detailed and thoughtful contribution by Abrams et al. (this issue, 2018) in which they contend that many in the tobacco field are exaggerating the harms over the benefits of non-combustible nicotine delivery systems, a practice that risks allowing preventable morbidity and mortality to go unchecked. Abrams and colleagues make a forceful argument for an alternative approach to seeing the role of non-combusted sources of nicotine in efforts to reduce cigarette smoking, which they refer to as a harm minimization model. Finally, the last two contributions to this section apply behavioral economic modeling to examine the potential for non-combusted nicotine products to substitute for combusted tobacco products. Bickel et al. (2018, this issue) experimentally models consumer demand and product substitution among current smokers using a novel experimental tobacco marketplace while Huang et al. (2018, this issue) use observational data from retail scanners in the actual tobacco marketplace to model the potential for substitution of non-combusted for combusted sources of nicotine. Together they contribute important and encouraging evidence on the potential substitutability of non-combusted nicotine delivery systems for combusted tobacco products.

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Further reading

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