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ABSTRACT

This Special Issue of *Preventive Medicine* (PM) is the 4th in a series on behavior change, health, and health disparities, a topic of critical importance to improving U.S. population health. The U.S. ranks near the bottom on measures of population health relative to other industrialized countries despite spending orders of magnitude more on health care than any other nation. Population health experts agree that the area of personal behavior, or lifestyle, such as substance abuse, physical inactivity/obesity, and non-adherence with medical regimens is the single largest contributor to this situation. These unhealthy behavior patterns disproportionately impact economically disadvantaged populations and other vulnerable populations and represent a major contributor to health disparities. Thus, behavior change represents an essential step in improving population health generally and curtailing health disparities more specifically. While perhaps more severe in the U.S., other industrialized countries are facing similar challenges with personal behavior patterns, adverse health impacts, and health disparities. Thus the topics discussed in this series have implications well beyond the U.S. In this 4th Special Issue we address (a) the potential health impacts of liberalizing laws on recreational marijuana use; (b) the ongoing challenge of tobacco use in vulnerable populations; and (b) the importance of weight management and physical activity in caring for vulnerable medical populations. Across each of these topics we include contributions from accomplished policymakers and scientists to acquaint readers with recent accomplishments and remaining knowledge gaps and challenges in these important topic areas.

1. Introduction

This Special Issue of Preventive Medicine (PM) is the 4th in a series that focuses on behavior change, health, and health disparities. The first Special Issue appeared in November 2014 (http://www.sciencedirect.com/science/journal/00917435/68/supp/C), the 2nd in November 2015 (http://www.sciencedirect.com/science/journal/00917435/80) and the third in November 2016 (http://www.sciencedirect.com/science/journal/00917435/92?sdc=1). 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.uvm.edu/medicine/behaviorandhealth/). This select subset of conferees was invited to contribute to this 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 the Guest Editor. Below I comment briefly on the rationale for organizing these annual conferences and associated publications as well the topics chosen for inclusion in this 4th Special Issue.

2. Unhealthy behavior patterns and risk for chronic disease and premature death

There is broad recognition that many individuals persist in behavior patterns (e.g., substance abuse, physical inactivity, unhealthy food choices, non-adherence with recommended medical regimens) that are strikingly harmful to their long-term health, and are a staggering financial burden on the health care systems of the U.S. and other industrialized countries (Higgins, 2015; Schroeder, 2016; Woolf and Aron, 2013). The current U.S. opioid addiction epidemic, which is having a devastating effect on U.S. population health, is an excellent example of this phenomenon (Compton et al., 2015; Sigmon et al., 2016; Volkow and Collins, 2017). Such unhealthy personal behavior patterns are estimated to be the largest contributor to premature deaths in the U.S. annually (~40%), with cigarette smoking alone being responsible for greater than 480,000 deaths/year in the U.S and 5 million globally (Higgins, 2015; Schroeder, 2016; Woolf and Aron, 2013). These behavior patterns increase risk for numerous chronic diseases, including cardiovascular disease, stroke, site-specific cancers, and type-2 diabetes. Importantly, because prevalence of these unhealthy behaviors is overrepresented among socioeconomically disadvantaged and other vulnerable populations, they are also important contributors to the unsettling

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problems of health disparities (Cutler and Lleras-Muney, 2010; Higgins and Chilcoat, 2009; Issacs and Schroeder, 2004; Kumanyika, 2012). Regarding costs to the health care system, direct medical costs of cigarette smoking in the U.S., for example, are estimated to exceed $170 billion annually, and those associated with overweight and obesity in the U.S., as another example, approximately $150 billion (Finkelstein et al., 2009; U.S. Department of Health and Human Services, 2014). These health-related behaviors are also major contributors to the dismal status of U.S. population health relative to other developed nations. For example, among the 34 developed nations with membership in the Organization for Economic Cooperation and Development, the U.S. ranks 25th in life expectancy, 29th in infant mortality, and 25th in maternal mortality (Higgins, 2015; Schroeder, 2016). These outcomes occur despite spending orders of magnitude more on healthcare than any other country. Importantly, when population health experts assess how to improve U.S. population health, the domain of personal behavior is identified as the area that offers the greatest potential for improvements (Higgins, 2014; Higgins, 2015; Schroeder, 2007; Schroeder, 2016). Hence, our overarching focuses on this topic area in the Vermont Center on Behavior and Health and in our annual conferences and associated Special Issues of *Preventive Medicine*.

3. Potential health impacts of legalizing recreational marijuana use

Legalization of marijuana use has gained considerable momentum in the U.S. with 28 states plus the District of Columbia (DC) legalizing medical marijuana use and 8 states plus DC legalizing recreational marijuana use, with similar liberalization of laws occurring in Canada and other countries (*NYTimes*, April 13, 2017). Such actions clearly have tremendous public health implications and it is important that those implications be considered using the best available scientific evidence. In this Special Issue we invited policy makers from Colorado (Ghosh et al., 2017, in this issue), the first U.S. state to legalize recreational marijuana use, Vermont (Chen and Searles, 2017, in this issue), a state currently considering legalization of recreational use, and the U.S.'s National Institute on Drug Abuse (Weiss and Wargo, 2017, in this issue) to provide a federal perspective on the health implications of legalizing recreational marijuana use. In addition to policy makers we invited contributions from scientific experts in the health impacts of marijuana use to address the implications of legalizing recreational marijuana use, including potential impacts on the epidemiology of marijuana use and risk perceptions among youth and adults (Carliner et al., 2017, in this issue), emergency medicine (Wang et al., 2017, in this issue), addiction risk (Budney and Borodovsky, 2017, in this issue), adolescent risks and potential interventions (Schuster et al., 2017; Walker, 2017, in this issue), and maternal and child health (Mark and Terplan, 2017, in this issue).

4. Tobacco use in vulnerable populations

While these recent political and legal developments regarding marijuana use demand careful scientific consideration in order to properly protect public health, we cannot to be distracted from other longstanding and more impactful behavioral health challenges, especially cigarette smoking. Cigarette smoking remains the largest contributor to premature death, being responsible for more than 480,000 premature deaths annually in the U.S. and 5,000,000 globally (U.S. Department of Health and Human Services, 2014). U.S. smoking prevalence dropped precipitously following the landmark U.S. Surgeon Generals report from approximately 42% in 1964 to 15% in 2015, a change estimated to have prevented 8 million premature deaths between 1964 and 2012 (Holford et al., 2014), and also netted tremendous health care cost savings (U.S. Department of Health and Human Services, 2014). Unfortunately those gains were disproportionately realized among the more affluent. Smoking prevalence decreased little or not at all among socioeconomically disadvantaged and other vulnerable populations (Higgins and Chilcoat, 2009; Chilcoat, 2009; Schroeder, 2016; U.S. Department of Health and Human Services, 2014). Thus, in this Special Issue we invited contributions on prevalence of cigarette smoking and use of other tobacco products among pregnant women (Higgins et al., 2017, in this issue; Kurti et al., 2017, in this issue), socioeconomically young adults (Villanti et al., 2017, in this issue), sexual minorities (Nayak et al., 2017, in this issue), and those residing in rural geographical areas (Doogan et al., 2017, in this issue). With the difficulties in promoting smoking cessation in these highly vulnerable populations, attention has appropriately turned to possible harm reduction strategies that might better protect these populations from the adverse health impacts of cigarette smoking, including substituting e-cigarettes for combusted tobacco cigarettes and reducing the maximal nicotine content of cigarettes to reduce the addiction potential of cigarettes smoking. The latter is an especially timely topic in light of the recent announcement from U.S. Food and Drug Administration Commissioner Scott Gottlieb, MD, indicating that the agency is moving forward with consideration of a national policy that would reduce the standard for maximal nicotine content of cigarettes and other combusted tobacco products to very low levels in order to better protect the U.S. public health by decreasing addiction potential of cigarette smoking (U.S. Food and Drug Administration, 2017). We invited contributions assessing prevalence and risk perceptions of e-cigarettes in the U.S. adult population (Pericot-Valverde et al., 2017, in this issue), the relative dependence potential of e-cigarettes versus conventional tobacco cigarettes (Liu et al., 2017, in this issue), and the extent to which abruptly switching smokers of usual nicotine low nicotine content cigarettes to very low nicotine content cigarettes may disrupt behavioral and cognitive performance in regular smokers (Keith et al., 2017, in this issue).

5. Weight management and physical activity in vulnerable medical populations

Lastly, as was discussed above, physical inactivity, overweight, and obesity have a substantial adverse impact on individual and population health. There is growing recognition of the need to attend to these conditions as part of effective treatment for a wide variety of medical conditions. To address this important development, we invited contributions underscoring the importance of obesity as an unaddressed risk factor for coronary heart disease and the place of weight loss in effective rehabilitation from a cardiac event (Ades and Savage, 2017, in this issue), in the prevention and treatment of type-2 diabetes (Delahanty, 2017, in this issue), as a component of treating advanced cancer (Dittus et al., 2017, in this issue), and in efforts to prevent greater-than-recommended gestational weight gain and the serious adverse impacts of maternal obesity on perinatal outcomes (Phillips and Higgins, 2017, in this issue).

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