Disparities in Rural Tobacco Use, Smoke-Free Policies, and Tobacco Taxes

Western Journal of Nursing Research
2019, Vol. 41(8) 1184–1202

DOI: 10.1177/0193945919828061
journals.sagepub.com/home/wjn


Kelly Buettner-Schmidt[1], Donald R. Miller[1], and Brody Maack[1]

Abstract

Tobacco use and exposure to secondhand smoke (SHS) remain leading causes of preventable disease, disability, and mortality in the United States. Rural populations are among those being left behind in the recent declining smoking rates and have become a focus of discussions on tobacco-related disparities. This article describes tobacco-related disparities in rural populations including tobacco use, exposure to SHS, smoke-free policies, and tobacco taxes. Nurses, as social justice and tobacco control policy advocates, are needed especially at the local level, where much of the policy work occurs and where nursing's voice is respected and can be powerful.

Keywords

electronic nicotine delivery systems, rural health, smoke-free policy, taxes, tobacco products, tobacco smoke pollution

Tobacco use has been identified as an issue of social justice since at least 2004 (Healton & Nelson, 2004). Healton and Nelson (2004) identified tobacco as a social justice issue because it is "bound up in corporate accountability,

[1]North Dakota State University, Fargo, ND, USA

Corresponding Author:
Kelly Buettner-Schmidt, School of Nursing, College of Health Professions, North Dakota State University, Fargo, ND 58102, USA.
Email: Kelly.buettner-schmidt@ndsu.edu

economic systems, and public health advocacy" (p. 186). They recognized the shift from the first 1964 U.S. Surgeon General Report on tobacco, where use was diverse across classes, with the wealthy smoking more, to current use by middle- and lower income populations, those with less education, and the marginalized or less privileged. More recently, rural populations have become the focus of discussions related to tobacco-related disparities.

Rural Tobacco Disparity

Tobacco use and exposure to secondhand smoke (SHS) remain leading causes of preventable disease, disability, and mortality in the United States and are responsible for approximately 480,000 deaths annually; another 16 million people are living with a tobacco-related serious illness (Centers for Disease Control and Prevention [CDC], 2017a). Rural populations are among those being left behind in the recent declining smoking rates (Doogan et al., 2017). People residing in rural areas are a disparate population due to higher overall disease prevalence and higher rates of premature death than the United States in general (Matthews et al., 2017). Rural residents have higher age-adjusted death rates that likely, in part, can be attributed to tobacco use (Garcia et al., 2017; Meit et al., 2014). Smoking harms nearly every organ of the body, and SHS can also cause serious illnesses (CDC, 2017a). Among the adverse health effects from tobacco use is an increased risk of dying from heart and respiratory diseases (Garcia et al., 2017). Heart disease and chronic obstructive pulmonary disease are highest in rural counties (Meit et al., 2014).

Rural areas have higher smoking rates than urban areas, most likely resulting from the demographic and psychosocial factors that are typically associated with rural areas, such as lower income and education levels and higher unemployment (American Lung Association [ALA], 2012). In addition, Doogan et al. (2017) found that tobacco control policies and other regulatory factors benefit urban areas more than rural areas. Furthermore, the low population density in rural areas results in decreased services and health communication (Matthews et al., 2017). Finally, tobacco crops are a source of income for many rural areas; thus, tobacco is more normalized into the culture (ALA, 2012).

Purpose

The purpose of this article is to review the state of the science and describe tobacco-related disparities in rural populations including tobacco use, exposure to SHS, smoke-free policies, and tobacco taxes.

Method

Rather than doing a comprehensive review of literature, we began with two key publications addressing rural tobacco, CDC's (2015a) "Best Practices User Guide: Health Equity in Tobacco Prevention and Control" and the ALA's (2012) "Cutting Tobacco's Rural Roots: Tobacco Use in Rural Communities." These documents were used to gather data on SHS exposure and smoke-free environments and policies. In addition, a health librarian–assisted literature search was conducted using PubMed, Google Scholar, and Web of Science with the following terms: ("tobacco smoke pollution" [Mesh] OR "tobacco use" [Mesh] OR "tobacco products" [Mesh]) AND ("rural population" [Mesh] OR "rural health" [Mesh]), and limiting articles to those written in the past 10 years and in the English language, resulting in 185 articles. Additional searches used the terms "smoke free" and "rural" and the terms "secondhand smoke" and "rural" and "tobacco" and "policies," again limiting articles to those written in the past 10 years and in the English language. Review of the citations from the pertinent articles led to additional articles, some older than 10 years. Only the most pertinent articles were included in this review.

Defining Rural

Rural has several definitions and measures, including those used by the U.S. Census Bureau (USCB), U.S. Department of Agriculture (USDA), National Center for Health Statistics, and others. This reflects the reality that urban and rural are multidimensional concepts.

Which definition to use is determined by whether it will be used for research, policy analysis, or programming, with the metropolitan–nonmetropolitan classification suited for economic and social changes (USDA Economic Research Service [USDA ERS], 2017). When authors of studies contained within this article indicated which definition is used, this is noted, as results or interpretation of results may have varied depending on the definition used. See online supplemental material for additional information.

Rural Tobacco Use and Tobacco Industry Marketing

Cigarettes and Smokeless Tobacco

Most recent data sources identified tobacco use prevalence in rural populations as higher than in nonrural areas. The differences between rural and

urban tobacco use can vary across regions of the United States (Roberts et al., 2016; Roberts et al., 2017).

Matthews et al. (2017) analyzed the 2013 Behavioral Risk Factor Surveillance System data using the 2013 Urban-Rural Classification Scheme (URCS) and found that rural counties (noncore counties) had the highest age-adjusted prevalence of smoking. Current rural smoking rates were 25.1% compared with overall smoking rates of 19%. The findings of Matthews et al. are supported by the 2014 *Update of the Rural-Urban Chartbook* that analyzed the 2010 to 2011 National Health Interview Survey (NHIS) data, and found that adults living in nonmetro counties (rural) had higher smoking rates than those in metro counties, with 25% of rural women and 29% of rural men smoking compared with 13% and 19% of women and men, respectively, in central counties of large metro areas (Meit et al., 2014). Similarly, analysis of the 2010 to 2012 NHIS data showed that among adults 18 to 64 years of age, smoking increased steadily with decreasing urbanization, with 16.9% of residents in large central metro counties and approximately 29% of residents in nonmetro counties smoking (Ingram & Franco, 2014). Rural residents were heavier smokers than the nonrural population (ALA, 2012), with smokers living in rural areas more likely to smoke 15 or more cigarettes per day than smokers living in urban areas (U.S. Department of Health and Human Services [USDHHS], 2014).

Interestingly, analysis of the 2014 National Survey on Drug Use and Health found that the rate of adult rural cigarette use of 23.6% was lower than the urban (26.4%) and smaller metro (25.6%) rates, but more than the large metro population (20.5%; CDC, 2018b). Doogan et al. (2017) analyzed data from the National Survey on Drug Use and Health from 2007 to 2014, and reported adjusted percentages of adult cigarette use at 27.3% in rural areas compared with 21.3% in urban areas. These authors found that urban residents experienced substantial declines in smoking prevalence over time, whereas rural residents did not. Further analysis of this finding identified that rural women lag behind rural men, and both urban women and men, with no declining trend of smoking prevalence in rural women between 2007 and 2014 (Cepeda-Benito et al., 2018).

Smokeless tobacco use is reported to be twice as high in rural areas (ALA, 2012). In 2014, smokeless tobacco use in rural areas was 10.3% compared with urban (5.7%), smaller metro (4.6%), and large metro (2.3%) areas (CDC, 2018b). Doogan et al. (2017) reported on data from 2007 to 2014, and found that rural smokeless tobacco use was 6.8% compared with 2.9% in urban areas.

Regarding tobacco use in adolescents, Meit et al. (2014) found that in 2010 to 2011, rural adolescent smoking was directly related to rurality, with the highest adolescent smoking rates of 11% in the most rural counties compared

with 5% in the central counties of large metro areas. Rural adolescents start smoking at younger ages, with daily smoking more common than their suburban or urban counterparts (ALA, 2012). Pesko and Robarts (2017) analyzed data from the National Youth Tobacco Survey (NYTS), 2011 to 2014, and found significantly higher use among middle and high school rural youth versus urban youth for current cigarette (10.97% vs. 6.66%), smokeless tobacco (6.98% vs. 2.87%), multiple tobacco products (10.26 vs. 7.27%), and any tobacco use (17.02% vs. 13.13%). Couch, Darius, Walsh, and Chaffee (2017) found that rural youth consider using smokeless tobacco as a norm in rural areas and a personal choice, with users emphasizing the social benefits and overlooking the health risks of smokeless tobacco use.

E-Cigarettes and Other Emerging Products

Electronic nicotine delivery systems (ENDS), commonly referred to as e-cigarettes, have demonstrated a strong emergence in recent years, particularly among youth. Although conventional cigarette consumption has been trending down, a rapid increase in ENDS use has led to concerns about diminishing the progress toward lower tobacco use (CDC, 2015b; USDHHS, 2016). ENDS products include a wide variety of devices, which allow the user to inhale aerosol that contains nicotine, various flavors, and several other additives, many of which have been found to be carcinogenic (USDHHS, 2016). These devices include "e-cigarettes," "e-hookahs," "vape pens," "mods," and more recently "heat-not-burn" products, as they are commonly known by manufacturers and users. The rate at which ENDS products' use has been adopted in the United States has led the U.S. Surgeon General to deem their use a public health concern (USDHHS, 2016).

Risk of adverse health effects of ENDS devices has been identified through a growing body of literature. The majority of literature to date has highlighted the addiction potential of nicotine from ENDS products, and the deleterious health effects of nicotine exposure on the developing brain in youth as well as fetus in pregnant users. This is of particular concern in ENDS users who have not previously used tobacco products, given that exposure to nicotine increases the likelihood of becoming a dual-user of both ENDS and tobacco, or switching to tobacco products (USDHHS, 2016). Presence of known carcinogens in ENDS liquid and aerosol, as well as the emerging evidence for ENDS aerosol to increase endogenous formation of carcinogens also, supports risk of cancer (Bustamante et al., 2018). There have also been reports of pulmonary and periodontal adverse health effects, although the long-term effects have not been well established due to the recent introduction of ENDS in the United States (Javed, Kellesarian, Sundar, Romanos, & Rahman,

2017). The heterogeneity of ENDS liquid contents and concentrations, often different from the label suggests, increases risk of harm to the user (Buettner-Schmidt, Miller, & Balasubramanian, 2016).

Use of ENDS devices as a means for effective cessation of conventional tobacco is controversial, and considered a possible harm reduction strategy by some. Results from cessation studies have been mixed, and due to the historic lack of regulation on the various ENDS products, along with the heterogeneity of products, it is difficult to extrapolate cessation outcomes to the real world. The National Academies of Sciences, Engineering, and Medicine (2018) concluded in a 2018 systematic evidence review that ENDS products could be less harmful than conventional smoking; however, scientific evidence with regard to long-term health effects is insufficient. The American College of Cardiology has recently recommended that clinicians first encourage use of Food and Drug Administration–approved smoking cessation pharmacotherapies in preference to ENDS products, and if an individual chooses to use an ENDS product as a means for cessation, he or she should be supported to achieve a goal of complete abstinence from all products, including ENDS products (Barua et al., 2018).

In the United States, ENDS use is seen more commonly among youth and young adults, than among adults. According to the CDC, 15.3% of adults have tried an ENDS product at least once ("ever use"), and 3.2% identified as current users, noting that the largest prevalence of both current and ever use occurred in young adults aged 18 to 24 years (CDC, 2017b). However, more than two million middle and high school students in the United States reported using an ENDS product in the past 30 days, making ENDS products the most common tobacco product used among students. Although the NYTS has shown a slight decrease in "current use" of ENDS products among students, results showed that 11.7% of high school and 3.3% of middle school students identified current use of ENDS in 2017 (Wang et al., 2018). Specific to rural areas, it is known that tobacco use prevalence is higher among those living in rural areas as compared with urban and suburban tobacco users (Noland et al., 2018). When surveying for ENDS use specifically, there is no clear distinction between rural and urban users; however, the NYTS demonstrated that urban cigarette smokers were more likely to also use ENDS products than their rural cigarette-smoking counterparts (Noland et al., 2018). In addition, urban youth have demonstrated a steady and rapid increase in prevalence of ENDS use, whereas rural youth have shown a slower increase in ENDS use, with the postulation that there is a more rapid decline in access to tobacco in rural areas as compared with urban areas (Pesko & Robarts, 2017). These data suggest that the disparity seen with higher tobacco use among rural youth may be changing with the emergence of ENDS products.

Tobacco Industry Marketing and Influence

Historically, the tobacco industry has targeted vulnerable low-income, minority, and young adult populations through targeted promotional materials and even through philanthropy (CDC, 2015a). Tobacco industry spending on marketing is actually on the rise, with more of it spent on promotions and sponsorships in stores than anywhere else (CDC, 2015a; Federal Trade Commission, 2013). Companies have typically targeted young rural men by using images of cowboys and race car drivers in their advertising (ALA, 2012; CDC, 2015a). Rural customers are also more likely to use smokeless tobacco and see advertising for tobacco products (ALA, 2012; Pesko & Robarts, 2017). A recent study has confirmed that county-level tobacco advertisement exposure is strongly positively associated with all forms of tobacco use among adolescents (Pesko & Robarts, 2017). A one-interval increase in this measure (e.g., from "rarely see tobacco advertisements" to "sometimes") was associated with about 3 times greater odds of current cigarette use, 6 times greater odds of current e-cigarette use, and 10 times greater odds of smokeless tobacco use.

Tobacco company advertising is sophisticated, but research has shown that equally sophisticated and nuanced counteradvertising can combat industry influence in rural areas. A variety of ad types, framing strategies, and media are needed to be most effective (Rayens et al., 2016; Riker et al., 2015).

A new marketing angle recently used by the tobacco industry is to promote the concept of "harm reduction" as a tool to make tobacco companies appear more concerned for customers. This strategy encourages customers to switch from high-risk combustible tobacco products to a lower risk form such as smokeless tobacco. Unfortunately, when used by tobacco companies, what appears to be a responsible harm-reduction strategy can be more honestly labeled as a nicotine addiction maintaining strategy (Gray, 2012).

Best Practices in Tobacco Control: Smoke-Free Policies and Tobacco Product Pricing

Overview of Best Practices

Evidence-based recommendations exist for tobacco prevention and control, including the CDC's (2014) *Best Practices for Comprehensive Tobacco Control Programs*, the Community Preventive Services Task Force's (CPSTF; n.d.) *Community Guide: Tobacco*, and the U.S. Prevention Service Task Force (2015). The CDC stated that effective interventions for tobacco control include enacting comprehensive smoke-free policies and increasing

the price of tobacco products. The CPSTF recommends interventions to create smoke-free policies and to increase the unit price for tobacco products.

SHS Exposure and Smoke-Free Laws

In the United States, approximately 41,000 deaths among nonsmokers and 400 infant deaths annually are caused by exposure to SHS, along with numerous other health effects (CDC, 2018a). Rural populations are exposed more to SHS than urban populations (ALA, 2012).

Households and housing. The percentage of children in small rural areas who live in a household with a smoker (35.0%) is greater than the percentage of children in urban areas who live with a smoker (24.4%; ALA, 2012). Also, residents of rural areas are more likely to allow smoking in the presence of children in their homes and cars (ALA, 2012).

In a study conducted in the primarily rural state of Montana, approximately 65% of public housing authority residents reported exposure to SHS in their homes; there was no difference in exposure between rural and nonrural residents, with rural being defined as a community with less than 10,000 population (Schmidt, Reidmohr, Helgerson, & Harwell, 2016). However, in South Dakota, also a rural state, a study of multiunit housing owners identified that owners in large rural counties had significantly more written smoke-free policies than in urban and frontier counties (Burdette et al., 2014). Among the Montana residents, support for an indoor smoke-free policy was high, at approximately 80% with no differences by rurality (Schmidt et al., 2016).

Butler et al. (2014) reported that residents of urban counties in Kentucky were nearly twice as likely as residents in rural counties to report having a smoke-free home. Kopp et al. (2018) reported bans on combustible and noncombustible tobacco in Ohio, with the urban locations experiencing an increased likelihood by 1.58 of having a complete ban; additionally, noncombustible product bans were more frequent in urban participants.

Public venues. As of July 1, 2018, 25 states had statewide smoke-free laws covering workplaces, restaurants, and bars, protecting 58.9% of the U.S. population; 17 states also included nontribal gambling venues, protecting 44.6% of the U.S. population; and 36 states required smoke-free workplaces, and/or restaurants, and/or bars, and/or nontribal gambling facilities, protecting 81.8% of the U.S. population (American Nonsmokers' Rights Foundation [ANRF], 2018). Passage of statewide, comprehensive, smoke-free laws has stalled, with only one enacted between 2012 and 2016 in North Dakota in 2012 (ANRF, 2018; Holmes, King, & Babb, 2016). In 2016, California's law was amended to be comprehensive (ANRF, 2018; Holmes et al., 2016).

In a longitudinal study evaluating the impact of North Dakota's statewide smoke-free law, exposure to SHS was assessed by measuring particulate matter. Prior to the passage of the law, rural areas experienced a disparity because of higher levels of SHS exposure in restaurants and bars than in nonrural areas (Buettner-Schmidt, Lobo, Travers, & Boursaw, 2015). However, enactment of the law led to rapid, substantial, and sustained declines in SHS exposure, resulting in elimination of the geographic disparity and protection of rural residents as well as nonrural residents (Buettner-Schmidt, Boursaw, & Lobo, 2018; Buettner-Schmidt, Boursaw, Lobo, & Travers, 2017). In addition, Lee et al. (2015) measured particulate matter in 71 rural hospitality venues before and after passage of local smoke-free laws, finding no differences in SHS exposure by rural or urban status, thereby concluding that residents of rural communities can be protected with a smoke-free policy.

Within most of the 10 states included in one study, urban areas were more likely to have strong smoke-free laws (Huang et al., 2015). The ALA (2012) states that there is a reluctance of rural government, at the state and local levels, to implement smoke-free laws. Also, rural communities may lack resources for policy implementation and policy enforcement leading to inconsistent adoption or enforcement of smoke-free policies, which can lead to disparities in the protections provided by policy (ALA, 2012).

Regarding workplace policies, Vander Weg, Cunningham, Howren, and Cai (2011) analyzed 2008 and 2011 Behavioral Risk Factor Surveillance System data, and found that rural areas were less likely to have workplace polices restricting smoking. This is supported by Ablah, Dong, and Konda (2017), whose recent study reported that worksites in rural Kansas counties were less likely to have tobacco-free policies than those in urban counties. A relatively new effort is under way to create smoke-free parks; and currently, parks in rural counties are less likely to have smoke-free policies than those in suburban or urban areas (Hood, Bernat, Ferketich, Danesh, & Klein, 2014).

Building support for smoke-free policies. Hahn and colleagues conducted several studies related to supporting smoke-free environments in rural areas in Kentucky. Results showed that strong tobacco control programs were more common in larger rural communities versus smaller communities (York et al., 2010). In addition, tailored, stage-specific interventions that include the translation and dissemination of knowledge and the building of capacity and demand for smoke-free policies, to advance smoke-free policies, resulted in increased readiness for policy change and adoption of policies in rural communities (Hahn, Rayens, Adkins, Begley, & York, 2015). Certain factors predicted public officials' perception that smoke-free laws would pass at the local level, including support from the local board of health and

local leaders and the presence of a smoke-free hospital (Rayens, York, Adkins, Kaufman, & Hahn, 2012). Effective media channels for rural communities include local television, newspaper, and radio; social media sites and the Internet; billboards; and print materials (Riker et al., 2015). Messages that target the dangers of SHS or that highlight the benefits of smoke-free air, and those that are localized to the rural community, have a potential role in educating and promoting smoke-free workplace policies in rural areas. The authors call for additional research to determine the message framing needed to move rural residents to act (Rayens et al., 2016). Also, print advertisement messaging focusing on faith-based messaging and social norms may support smoke-free policies in rural areas, although this needs to be studied further for applicability to other rural residents (Kostygina, Hahn, & Rayens, 2014). Policy advocacy interventions, specifically media advocacy, in rural communities increased the amount of and prominence of print media related to SHS and regulations and, thus, may increase public awareness and support for smoke-free policies (Hahn et al., 2017). Smaller rural communities may need assistance to have strong tobacco control programs (York et al., 2010).

Health communication strategies to build support in rural communities for smoke-free policies are supported by CDC's (2014) Best Practices recommendations, specifically for communications to be strategic and culturally sensitive through use of paid media, earned media (media advocacy), advertising in television, radio, billboards, print, social media, and more. Hahn and colleagues' (2017) most recent findings suggest that advocacy for smoke-free policies in local print media may be particularly important to increase policy protections for rural communities and needs further study.

Tobacco Taxes in Predominantly Rural Versus Urban States

Taxes on tobacco products are one of the most effective ways to reduce smoking because they raise the price and discourage consumption (Chaloupka, Yurekli, & Fong, 2012). Although tobacco taxes are sometimes criticized as being regressive and adversely affecting the poor, low-income users are also most responsive to price. Thus, an increase in taxes will lead to highest declines in use by low-income persons, with the greatest benefits in health accruing to them. In addition, the increased tax revenues can be earmarked for programs that increase tobacco cessation or public insurance programs that benefit low-income persons (Chaloupka et al., 2012).

The federal government currently levies a US$1.01 tax on each pack of cigarettes and each state also places a tax on cigarettes. However, the rates of state taxation vary dramatically (Campaign for Tobacco-Free Kids [CTFK],

2018). From 1981 to 2011, state cigarette excise tax rates grew at 6 times the rate of inflation, but growth varied considerably by time period and region (Golden, Ribisi, & Perreira, 2014). Unfortunately, from 2010 to 2014, increases in state taxes slowed (Holmes et al., 2016). Although tax rates may partially reflect a need for increased tax revenues, research has linked cigarette tax rates more strongly to state tobacco production, citizen attitudes toward taxes and tobacco control, political control of state legislatures, and cigarette tax rates in neighboring states (Golden et al., 2014).

Legal, economic, social, and physical environments all shape tobacco use behavior. Rural states are generally more politically conservative, which affects attitudes toward policies seen as paternalistic or abridging individual freedoms. Fox, Feng, and Yumkham (2017) have noted how political context and ideology affect policies and health behavior. They found states with more liberal citizen ideologies increased cigarette excise taxes over time much more than conservative states.

Luke, Stamatakis, and Brownson (2000) have also looked at youth-access tobacco control policies and youth smoking in the United States. Although their study is now somewhat dated, they also found that states with the most extensive tobacco control policies tended to impose higher cigarette taxes, be less rural, and be more likely to have Democratic party leadership.

We could find no data on a correlation between rural status and cigarette excise taxes, so we found the state tax rates as of July 1, 2018 (CTFK, 2018), and correlated these with 2010 state census data on percentage rural, both by percentage of population and by percentage of geographic area (USCB, 2010). There was a Pearson correlation coefficient of $-.42$ ($p = .003$) between tax rate and either rural classification (Figure 1). Thus, for whatever reasons, there is a clear relationship between ruralness and cigarette taxes. Of interest, Maine and Vermont are clear outliers in being heavily rural states with high cigarette taxes. If those two states are eliminated, the correlations rise to $-.57$.

Local municipalities may add their own taxes on cigarettes in some cases. State constitutions and laws specify the powers of local governments, and these may prohibit or expressly allow local governments to use certain powers used by the state. Where delineation of powers is unclear, most states use something called Dillon's Rule, meaning that local governments can only exercise authority explicitly delegated to them. However, many states may grant local governments general power to manage their affairs under a "home rule" charter that gives the municipality greater law and policy-making authority, including ability to add taxes (Tobacco Control Legal Consortium, 2015). Twenty-one states explicitly prohibit local governments from adding taxes on tobacco products, whereas seven states do allow local tobacco taxes (Tobacco Control Legal Consortium, 2016). By our examination of the

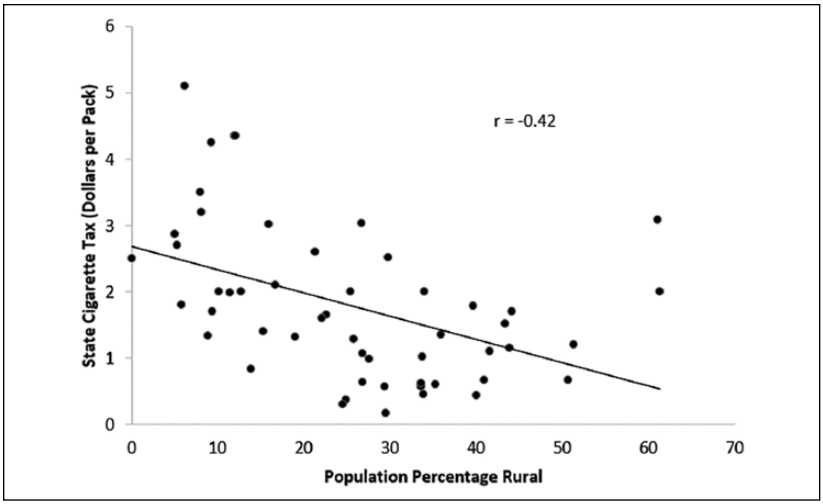

Figure 1. Scatterplot of state tax rates, as of July 1, 2018 (Campaign for Tobacco-Free Kids, 2018), and rural classification by 2010 percentage of population (U.S. Census Bureau, 2010).

previously referenced data, among the 21 states that *prohibit* local taxation, nine (43%) are in the top half of rural ranking by population and 11 (53%) by geography, and among the seven that *allow* them, two (29%) are in the top half of most rural by population or by geography. Thus, despite the negative correlation between state tobacco rates and ruralness, there is a small relationship between rural status and prohibition of local taxes.

Taxes on nicotine-containing, noncigarette items (smokeless tobacco, e-cigarettes) are more variable. One study found that e-cigarette sales are quite responsive to price changes (Huang, Tauras, & Chaloupka, 2014). Thus, higher taxes on e-cigarettes should discourage use. Differential tax policies on different nicotine-containing products may lead to users substituting cheaper products for more expensive ones.

Future Directions

The CDC (2015a) recommends specific actions to reduce tobacco use in rural areas. These include measuring use of tobacco and SHS exposure, including members of the community to identify policies and messages that will resonate within the community, identifying local committed champions to work toward change within the community, buying media that reach rural commu-

nities, using e-learning and mobile technologies, and educating rural residents about smokeless tobacco use and its harms.

Of the best practices discussed in this article, protecting people from the harm of SHS exposure, be

it through workplace policies or public policies, such as tobacco-free parks or statewide comprehensive tobacco-free laws, is essential to improve the health of rural residents and all citizens. Although research has been conducted in relation to rural areas and smoke-free policies, more is needed as described previously and later. In addition, increasing excise taxes on all tobacco products is highly recommended to reduce consumption in rural states. This article adds to the sparse literature on rural states and taxes, with a negative correlation between the state tobacco tax rates and ruralness. Attempts to achieve an increase in tobacco tax rates must be sensitive to political ideology. Progress on state-wide smoke-free laws and excise taxes appears to have slowed in recent years, and we cannot allow this to continue.

Future study is needed in several areas based on gaps identified in this article. Specifically, describing use of ENDS products specific to rural populations as compared with urban populations has not been well established. Continued work is needed to better define the efficacy of ENDS for use as a cessation aid, while considering how the availability of these products affect use by youth in rural settings. The continued study of most effective countermarketing strategies aimed at rural populations would also be important to prevent use of tobacco, the rise in ENDS use, and support for smoke-free policies among rural populations. Finally, more research on effectively influencing policy makers in rural state legislatures is needed.

Nursing has an extensive history in social justice as Nightingale (Watson, 2008) and Lillian Wald (Sklar, 2003) were social justice advocates. Some of the attributes of social justice, which may influence successful implementation of best practices in tobacco prevention and control, are equity in the distribution of power, resources, and processes; just institutions, systems, structures, policies, and processes; and sufficiency of well-being (Buettner-Schmidt & Lobo, 2012). Many nurses are currently engaged in addressing these attributes that affect the disparity of tobacco use, be it in rural or nonrural areas, and, rightfully so, as the use of tobacco affects nearly every bodily system of people, at every age, and it affects entire communities (Buettner-Schmidt & Malone, 2016). More nurses are needed in policy, especially in advocacy roles, as much of policy work occurs at the local level where nursing's voice is respected and can be powerful.

Tobacco use and exposure to SHS remain the leading causes of death and disability in the United States. The disparity of tobacco use in rural areas of

the United States means that rural populations disproportionately suffer the adverse health effects of this use. Best practices exist that can and should be implemented to address this disparity. Just as the causes of this disparity are complex, attempts to address it must use a combination of informed policy, and use of appropriate education and social messaging for rural populations.

Declaration of Conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Supplemental Material

Supplemental material is available for this article online.

ORCID iDs

Kelly Buettner-Schmidt https://orcid.org/0000-0001-9612-2405
Donald R. Miller https://orcid.org/0000-0003-3075-0606

References

Ablah, E., Dong, F., & Konda, K. (2017). Tobacco-free policies at worksites in Kansas. *BMC Public Health*, *17*(1), Article 566. doi:10.1186/s12889-017-4277-9

American Lung Association. (2012). *Cutting tobacco's rural roots: Tobacco use in rural communities*. Retrieved from http://www.lung.org/assets/documents/research/cutting-tobaccos-rural-roots.pdf

American Nonsmokers' Rights Foundation. (2018, July 1). *Summary of 100% smokefree state laws and population protected by 100% U.S. smokefree laws*. Retrieved from https://no-smoke.org/wp-content/uploads/pdf/SummaryUSPopList.pdf

Barua, R. S., Rigotti, N. A., Benowitz, N. L., Cummings, K. M., Jazayeri, M. A., Morris, P. B., . . . Wiggins, B. S. (2018). 2018 ACC expert consensus decision pathway on tobacco cessation treatment. *Journal of the American College of Cardiology*, *72*, 3332-3365. doi:10.1016/j.jacc.2018.10.027

Buettner-Schmidt, K., Boursaw, B., & Lobo, M. L. (2018). Place and policy: Secondhand smoke exposure in bars and restaurants. *Nursing Research*, *67*, 324-330. doi:10.1097/NNR.0000000000000286

Buettner-Schmidt, K., Boursaw, B., Lobo, M. L., & Travers, M. J. (2017). Tobacco smoke pollution in hospitality venues before and after passage of statewide smoke-free legislation. *Public Health Nursing*, *34*, 166-175. doi:10.1111/phn.12301

Buettner-Schmidt, K., & Lobo, M. L. (2012). Social justice: A concept analysis. *Journal of Advanced Nursing*, *68*, 948-958. doi:10.1111/J.1365-2648.2011.05856.X

Buettner-Schmidt, K., Lobo, M. L., Travers, M. J., & Boursaw, B. (2015). Tobacco smoke exposure and impact of smoking legislation on rural and non-rural hospitality venues in North Dakota. *Research in Nursing & Health*, *38*, 268-277. doi:10.1002/nur.21662

Buettner-Schmidt, K., & Malone, R. E. (2016). Taking action: The Nightingales take on big tobacco. In D. J. Mason, D. B. Gardner, F. Hopkins Outlaw, & E. T. O'Grady (Eds.), *Policy and politics in nursing and health care* (7th ed., pp. 632-641). St. Louis, MO: Elsevier.

Buettner-Schmidt, K., Miller, D. R., & Balasubramanian, N. (2016). Electronic cigarette refill liquids: Child-resistant packaging, nicotine content, and sales to minors. *Journal of Pediatric Nursing*, *31*, 373-379. doi:10.1016/j.pedn.2016.03.019

Burdette, L. K., Rowe, G. C., Johansen, L., Kerkvliet, J. L., Nagelhout, E., Lewis, K., & Fahrenwald, N. L. (2014). A statewide assessment of smoke-free policy in multiunit housing settings. *Nicotine and Tobacco Research*, *16*, 1593-1598. doi:10.1093/ntr/ntu114

Bustamante, G., Ma, B., Yakovlev, G., Yershova, K., Le, C., Jensen, J., . . . Stepanov, I. (2018). Presence of the carcinogen N'-Nitrosonornicotine in saliva of e-cigarette users. *Chemical Research in Toxicology*, *31*, 731-738. doi:10.1021/acs.chemrestox.8b00089

Butler, K. M., Rayens, M. K., Ashford, K., Adkins, S., Gombeski, B., Britt, J., & Hahn, E. J. (2014). Smoke-free homes, strength of smoke-free law, and children in the home. *Nicotine and Tobacco Research*, *16*, 485-490. doi:10.1093/ntr/ntt191

Campaign for Tobacco-Free Kids. (2018, June 25). *State cigarette excise tax rates and rankings*. Retrieved from https://www.tobaccofreekids.org/assets/factsheets/0097.pdf

Centers for Disease Control and Prevention. (2014). *Best practices for comprehensive tobacco control programs—2014*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. Retrieved from https://www.cdc.gov/tobacco/stateandcommunity/best_practices/index.htm

Centers for Disease Control and Prevention. (2015a). *Best practices user guide: Health equity in tobacco prevention and control*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. Retrieved from https://www.cdc.gov/tobacco/stateandcommunity/best-practices-health-equity/pdfs/bp-health-equity.pdf

Centers for Disease Control and Prevention. (2015b). Tobacco use among middle and high school students-United States, 2011-2014. *Morbidity and Mortality Weekly Report*, *64*, 381-385. Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6414a3.htm

Centers for Disease Control and Prevention. (2017a). *At a glance 2017. Tobacco use: Extinguishing the epidemic*. Retrieved from https://www.cdc.gov/chronicdisease/resources/publications/aag/pdf/2017/tobacco-aag-H.pdf

Centers for Disease Control and Prevention. (2017b). QuickStats: Percentage of adults who ever used an e-cigarette and percentage who currently use e-cigarettes, by age group—National Health Interview Survey, United States, 2016. *Morbidity Mortality Weekly Report*, *66*, 892. doi:10.15585/mmwr.mm6633a6

Centers for Disease Control and Prevention. (2018a, July). *Smoking & tobacco use. Secondhand smoke*. Retrieved from https://www.cdc.gov/tobacco/basic_information/secondhand_smoke/index.htm

Centers for Disease Control and Prevention. (2018b, March 7). *Smoking & tobacco use. Tobacco use by geographic region*. Retrieved from https://www.cdc.gov/tobacco/disparities/geographic/index.htm

Cepeda-Benito, A., Doogan, N. J., Redner, R., Roberts, M. E., Kurti, A. N., Villanti, A. C., . . . Higgins, S. T. (2018). Trend differences in men and women in rural and urban U.S. settings. *Preventive Medicine*, *117*, 69-75. doi:10.1016/j.ypmed.2018.04.008

Chaloupka, F. J., Yurekli, A., & Fong, G. T. (2012). Tobacco taxes as a tobacco control strategy. *Tobacco Control*, *21*, 72-180. doi:10.1136/tobaccocontrol-2011-050417

Community Preventive Services Task Force. (n.d.). *The community guide: Tobacco*. Retrieved from https://www.thecommunityguide.org/topic/tobacco

Couch, E. T., Darius, E., Walsh, M. M., & Chaffee, B. W. (2017). Smokeless tobacco decision-making among rural adolescent males in California. *Journal of Community Health*, *42*, 544-550. doi:10.1007/s10900-016-0286-3

Doogan, N. J., Roberts, M. E., Wewers, M. E., Stanton, C. A., Keith, D. R., Gaalema, D. E., . . . Higgins, S. T. (2017). A growing geographic disparity: Rural and urban smoking trends in the United States. *Preventive Medicine*, *104*, 79-85. doi:10.1016/j.ypmed.2017.03.011

Federal Trade Commission. (2013). *Federal Trade Commission cigarette report for 2011*. Washington, DC: Federal Trade Commission. Retrieved from https://www.ftc.gov/reports/federal-trade-commission-cigarette-report-2011

Fox, A. M., Feng, W., & Yumkham, R. (2017). State political ideology, policies and health behaviors: The case of tobacco. *Social Science and Medicine*, *181*, 139-147. doi:10.1016/j.socscimed.2017.03.056

Garcia, M. C., Faul, M., Massetti, G., Thomas, C. C., Hong, Y., Bauer, U. E., & Iademarco, M. F. (2017). Reducing potentially excess deaths from the five leading causes of death in the rural United States. *Morbidity and Mortality Weekly Report Surveillance Summaries*, *66*, 1-7. Retrieved from https://www.cdc.gov/mmwr/volumes/66/ss/ss6602a1.htm

Golden, S. D., Ribisi, K. M., & Perreira, K. M. (2014). Economic and political influence on tobacco tax rates: A nationwide analysis of 31 years of state data. *American Journal of Public Health*, *104*, 350-357. doi:10.2105/AJPH.2013.301537

Gray, N. (2012). Has Marlboro hijacked tobacco harm reduction? *Addiction*, *107*, 1029-1030. doi:10.1111/j.1360-0443.2011.03748.x

Hahn, E. J., Kolpek, J. K., Lee, E., Record, R., Wiggins, A. T., Butler, K. M., & Rayens, M. K. (2017). Rural print media and a tailored advocacy intervention for smoke-free policy. *American Journal of Health Promotion*, *31*, 52-58. doi:10.4278/ajph.140725-QUAN-364

Hahn, E. J., Rayens, M. K., Adkins, S., Begley, K., & York, N. (2015). A controlled community-based trial to promote smoke-free policy in rural communities. *Journal of Rural Health*, *31*, 76-78. doi:10.1111/jrh.12087

Healton, C., & Nelson, K. N. (2004). Reversal of misfortune: Viewing tobacco as a social justice issue. *American Journal of Public Health*, *94*(2), 186-191.

Holmes, C. B., King, B. A., & Babb, S. D. (2016). Stuck in neutral: Stalled progress in statewide comprehensive smoke-free laws and cigarette excise taxes, United States, 2000–2014. *Preventing Chronic Disease, 13*(E80), 150409. doi:10.5888/pcd13.150409

Hood, N. E., Bernat, D. H., Ferketich, A. K., Danesh, D., & Klein, E. G. (2014). Community characteristics associated with smokefree park policies in the United States. *Nicotine and Tobacco Research*, *16*, 828-835. doi:10.1093/ntr/ntu007

Huang, J., King, B. A., Babb, S. D., Xu, X., Hallett, C., & Hopkins, M. (2015). Sociodemographic disparities in local smoke-free law coverage in 10 states. *American Journal of Public Health*, *105*, 1806-1813. doi:10.2105/AJPH.2015.302655

Huang, J., Tauras, J., & Chaloupka, F. J. (2014). The impact of price and tobacco control policies on the demand for electronic nicotine delivery systems. *Tobacco Control, 23*, iii41-iii47. doi:10.1136/tobaccocontrol-2013-051515

Ingram, D. D., & Franco, S. J. (2014). *2013 NCHS urban-rural classification scheme for counties* (Vital Health Statistics, Series 2, No. 166, pp. 1-73). National Center for Health Statistics. Retrieved from https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf

Javed, F., Kellesarian, S. V., Sundar, I. K., Romanos, G. E., & Rahman, I. (2017). Recent updates on electronic cigarette aerosol and inhaled nicotine effects on periodontal and pulmonary tissues. *Oral Diseases*, *23*, 1052-1057. doi:10.1111/odi.12652

Kopp, B. T., Hinton, A., Lu, R., Cooper, S., Nagaraja, H., & Wewers, M. E. (2018). Impact of presence of children on indoor tobacco restrictions in households of urban and rural adult tobacco users. *American Pediatrics*, *18*, 920-927. doi:10.1016/j.acap.2018.04.002

Kostygina, G., Hahn, E. J., & Rayens, M. K. (2014). "It's about the smoke, not the smoker": Messages that motivate rural communities to support smoke-free policies. *Health Education Research*, *29*, 58-71. doi:10.1093/her/cyt087

Lee, K., Hwang, Y., Hahn, E. J., Bratset, H., Robertson, H., & Rayens, M. K. (2015). Secondhand smoke exposure is associated with smoke-free laws but not urban/rural status. *Journal of the Air & Waste Management Association*, *65*, 624-627. doi:10.1080/10962247.2015.1006376

Luke, D. A., Stamatakis, K. A., & Brownson, R. C. (2000). State youth-access tobacco control policies and youth smoking behavior in the United States. *American Journal of Preventive Medicine*, *19*, 180-187.

Matthews, K. A., Croft, J. B., Liu, Y., Kanny, D., Wheaton, A. G., Cunningham, T. J., . . . Giles, W. H. (2017). Health-related behaviors by urban-rural county classification—United States, 2013. *Morbidity and Mortality Weekly Report Surveillance Summary*, *66*(5), 1-8. doi:10.15585/mmwr.ss6605a1

Meit, M., Knudson, A., Gilbert, T., Tzy-Chyi, A., Tanenbaum, E., Ormson, E., . . . Popat, S. (2014). *The 2014 update of the rural–urban chartbook*. Grand Forks, ND: Rural Health Research & Policy Centers. Retrieved from https://ruralhealth.und.edu/projects/health-reform-policyresearch-center/pdf/2014-rural-urban-chartbook-update.pdf

National Academies of Science, Engineering, and Medicine. (2018). *Public health consequences of e-cigarettes*. Washington, DC: The National Academies Press.

Noland, M., Rayens, M. K., Wiggins, A. T., Huntington-Moskos, L., Rayens, E. A., Howard, T., & Hahn, E. J. (2018). Current use of e-cigarettes and conventional cigarettes among US high school students in urban and rural locations: 2014 National Youth Tobacco Survey. *American Journal of Health Promotion*, *32*, 1239-1247. doi:10.1177/0890117117719621

Pesko, M. F., & Robarts, A. M. T. (2017). Adolescent tobacco use in urban versus rural areas of the united states: The influence of tobacco control policy environments. *Journal of Adolescent Health*, *61*, 70-70. doi:10.1016/j.jadohealth.2017.01.019

Rayens, M. K., Butler, K. M., Wiggins, A. T., Kostygina, G., Langley, R. E., & Hahn, E. J. (2016). Recall and effectiveness of messages promoting smoke-free policies in rural communities. *Nicotine & Tobacco Research*, *18*, 1340-1347. doi:10.1093/ntr/ntv197

Rayens, M. K., York, N. L., Adkins, S. M., Kaufman, E. L., & Hahn, E. J. (2012). Political climate and smoke-free laws in rural Kentucky Communities. *Policy and Politics in Nursing Practice*, *13*, 90-97. doi:10.1177/1527154412456434

Riker, C. A., Butler, K. M., Ricks, J. M., Record, R. A., Begley, K., Anderson, D. G., & Hahn, E. J. (2015). Creating effective media messaging for rural smoke-free policy. *Public Health Nursing*, *32*, 613-624. doi:10.1111/phn.12188

Roberts, M. E., Doogan, N. J., Kurti, A. N., Redner, R., Gaalema, D. E., Stanton, C. A., . . . Higgins, S. T. (2016). Rural tobacco use across the United States: How rural and urban areas differ, broken down by census regions and divisions. *Journal of Community Health*, *39*, 153-159.

Roberts, M. E., Doogan, N. J., Stanton, C. A., Quisenberry, A. J., Villanti, A. C., Gaalema, D. E., . . . Higgins, S. T. (2017). Rural versus urban use of traditional and emerging tobacco products in the United States, 2013-2014. *American Journal of Public Health*, *107*, 1544-1559. doi:10.2105/AJPH.2017.303967

Schmidt, L. M., Reidmohr, A. A., Helgerson, S. D., & Harwell, T. S. (2016). Secondhand smoke exposure and smoke-free policy support among public housing authority residents in rural and tribal settings. *Journal of Community Health*, *41*, 1116-1121. doi:10.1007/s10900-016-0204-8

Sklar, K. K. (2003). "Some of us who deal with the social fabric": Jane Addams blends peace and justice, 1907-1919. *Journal of the Gilded Age and Progressive Era*, *2*, 80-96. Retrieved from http://www.jstor.org/stable/25144318

Tobacco Control Legal Consortium. (2015, April). *State & local public health: An overview of regulatory authority*. Retrieved from http://www.publichealthlawcenter.org/sites/default/files/resources/phlc-fs-state-local-reg-authority-publichealth-2015_0.pdf

Tobacco Control Legal Consortium. (2016). *U.S. local tobacco tax authority: A 50-state review*. Retrieved from http://www.publichealthlawcenter.org/sites/default/files/resources/tclc-tobacco-tax-authority-50-state-review-2016.pdf

U.S. Census Bureau. (2010). *2010 census urban and rural classification and urban area criteria*. Retrieved from https://www.census.gov/geo/reference/ua/urban-rural-2010.html

U.S. Department of Agriculture, Economic Research Service. (2017, May 1). *Rural classifications: What is rural?* Retrieved from https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural/

U.S. Department of Health and Human Services. (2014). *The health consequences of smoking—50 years of progress: A report of the surgeon general*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

U.S. Department of Health and Human Services. (2016). *E-cigarette use among youth and young adults: A report of the surgeon general*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

U.S. Prevention Service Task Force. (2015). Behavioral and pharmacotherapy interventions for tobacco smoking cessation in adults, including pregnant women: U.S. Preventive Services Task Force recommendation statement. *Annals of Internal Medicine*, *163*, 622-634. doi:10.7326/M15-2023

Vander Weg, M. W., Cunningham, C. L., Howren, M. B., & Cai, X. (2011). Tobacco use and exposure in rural areas: Findings from the Behavioral Risk Factor Surveillance System. *Addictive Behaviors*, *36*, 231-236. doi:10.1016/j.addbeh.2010.11.005

Wang, T. W., Gentzke, A., Sharapova, S., Cullen, K. A., Ambrose, B. K., & Jamal, A. (2018). Tobacco product use among middle and high school students—United States, 2011–2017. *Morbidity and Mortality Weekly Report*, *67*, 629-633. doi:10.15585/mmwr.mm6722a3

Watson, J. (2008). Social justice and human caring: A model of caring science as a hopeful paradigm for moral justice for humanity. *Creative Nursing*, *14*(2), 54-61.

York, N. L., Rayens, M. K., Zhang, M., Jones, L. G., Casey, B. R., & Hahn, E. J. (2010). Strength of tobacco control in rural communities. *Journal of Rural Health*, *26*, 120-128. doi:10.1111/j.1748-0361.2010.00273x