Urban-rural differences in tobacco product availability in food retailers, United States, 2017

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Abstract

Purpose: Tobacco use prevalence is higher in rural compared to urban settings, possibly due to differences in tobacco availability, including the option to purchase food and other essential items in stores that do not sell tobacco (tobacco-free food retailers). The goal of this research is to determine whether tobacco-free food retailer availability varies by urbanicity/rurality.

Methods: Using the 2017 National Establishment Time-Series database, we identified food retailers across all census tracts containing food retailers in the United States (n = 66,053). We used multivariable logistic and linear regression models to test whether tobacco-free food retailer availability varied across 4-levels of census tract urbanicity/rurality (urban, suburban, large town, and small town/rural) for 2 outcomes: (1) the presence of at least 1 tobacco-free food retailer and (2) the percent of all food retailers that were tobacco-free.

Findings: Compared to urban core census tracts, suburban census tracts had a lower odds (aOR = 0.77, 95% CI = 0.73, 0.81) of having at least 1 tobacco-free food retailer, while small town/rural census tracts had greater odds (aOR = 1.23, 95% CI = 1.15, 1.32). Suburban census tracts (B = −2.29, $P < .001$) and large town census tracts (B = −1.90, $P < .001$) also had a lower percentage of tobacco-free food retailers compared to urban census tracts.

Conclusions: Compared to urban cores, tobacco-free food retailers were less prevalent in suburban and large town areas, though similarly or slightly more available in rural areas. Future research should assess whether these differences depend on varying store types.

KEYWORDS
food retailers, geography, tobacco, urban-rural continuum

INTRODUCTION

Tobacco use is the most prevalent risk factor for morbidity and second most prevalent risk factor for death in the United States.[1] Though the prevalence of cigarette smokers decreased roughly 67% between 1965 and 2017,[2] disparities in tobacco use remain and are worsening between urban and rural settings.[3,4] In 2018, 36% of adults in rural counties reported using tobacco products in the past year compared

to 26% of adults in large metropolitan counties.[5] Rural areas also have a larger percent of excess deaths due to tobacco-related disease (eg, cancer, heart disease, and stroke) compared to urban areas.[6]

Tobacco retailer availability, or density, could contribute to these differences. Within the United States, there are more tobacco retailers total and per 1,000 people in rural, compared to urban areas.[7,8] Corporate decisions by large retailers, like CVS (pharmacy), to stop selling tobacco, and others, like Family Dollar (discount store), to begin selling tobacco, may be contributing to ongoing differences.[9] Analysis of tobacco retailer density in the southeastern United States found that after these corporate decisions, rural counties experienced a greater increase in tobacco retailer density compared to urban counties.[9]

Food retailers are critically important for individuals, functioning as a common source of both food and other essential items. Many food retailers also sell tobacco products, creating a potential exposure to the tobacco product itself along with tobacco marketing. Tobacco marketing in the retail setting is a major target for tobacco manufacturers[10–13] and is associated with tobacco susceptibility and use.[14] Current adult smokers are most likely to purchase cigarettes from convenience stores/gas-stations, tobacco discount stores, drug stores, supermarkets, and liquor stores.[15] Three of these 5 store types (convenience stores/gas-stations, drug stores, and supermarkets) are also major food retailers, accounting for approximately 69% of retail food sales and 64% of retail tobacco sales according to the 2017 US Economic Census.[16] Though many food retailers sell tobacco products (eg, Walmart, Sam's Club, and Walgreens), some abstain (eg, Trader Joe's, Whole Foods, and CVS). Availability of these 2 types of food retailers varies along the urban-rural continuum. For example, an analysis in California found that isolated/rural and large rural census tracts were more likely to have dollar stores, which sell tobacco, than urban census tracts were.[17] Other research indicates that more than two-thirds of CVS pharmacies, which recently stopped selling tobacco, are located in urban counties.[18]

This study asks 2 research questions: (1) Are small town/rural census tracts across the United States less likely to have a tobacco-free food retailer than more urban census tracts on the urban-rural continuum, and (2) Do small town/rural census tracts have a smaller percentage of food retailers that are tobacco-free than more urban census tracts on the urban-rural continuum?

METHODS

Tobacco and food retailer data

Using North American Industry Classification System (NAICS) codes, we defined food retailers as brick-and-mortar store types that: accounted for greater than 1% of total retail food sales in 2017[16] or were previously identified as specialty food retailers in the food environment.[19–25] The final list of food retailers included all retailers from the following NAICS codes: supermarkets and other grocery stores (445110), convenience stores (445120), meat markets (445210), fish and seafood markets (445220), fruit and vegetable markets (445230), pharmacies and drug stores (446110), gas stations with convenience stores (447110), warehouse clubs and supercenters (452311), and general merchandise stores (452319). Fruit and vegetable markets, seafood markets, and meat markets are referred to as "specialty food retailers" hereafter.

We developed our list of US food retailers using NAICS and Standard Industrialized Classification (SIC) codes in the 2017 National Establishment Time Series Database.[26] Between 2012 and 2017, the NAICS code for discount department stores (452112) was eliminated. Most stores were reclassified into warehouse clubs and supercenters (452311) or department stores (452210). Therefore, in addition to keeping all retailers classified under the NAICS codes specified above, we also searched the department store NAICS code explicitly for known food retailers (eg, Walmart and Target) and then added them to our final dataset.

Tobacco-free food retailer availability

Using protocols adapted from tobacco retailer studies,[7,8,27] we identified which food retailers in our database were unlikely to sell tobacco and thus be classified as tobacco-free. Meat markets, fish and seafood markets, and fruit and vegetable markets account for an estimated 0% of tobacco sales according to the 2017 Economic Census.[16] We therefore considered them tobacco-free. Using data collated by the American Nonsmokers' Rights Foundation US Tobacco Control Laws Database©, we omitted pharmacies located in places with bans on pharmacy tobacco sales. We then reviewed corporate and organizational websites, news reports, and tobacco control legislation to identify specific supermarkets, pharmacies, warehouse clubs, and general merchandise stores as tobacco-free food retailers. Following a process detailed elsewhere,[27] we also identified retailers that have corporate policies prohibiting the sale of tobacco (eg, Whole Foods, CVS, and small independent pharmacies), or have been identified by tobacco advocacy groups as tobacco-free (eg, Sprouts Farmers Market).

We measured tobacco-free food retailers within census tracts, administrative units developed by the US Census Bureau. We spatially joined each retailer to its respective census tract and then calculated 2 tract-level measures of tobacco-free food retailer availability for each census tract with at least 1 food retailer within it: (1) a dichotomous variable indicating whether a census tract had at least 1 tobacco-free food retailer and (2) a continuous variable indicating the percentage of all food retailers in a census tract that are tobacco-free (percent tobacco-free food retailers).

Rural-urban geography, population, and demographic measures

To identify the urbanicity/rurality of census tracts, we used 2010 US Department of Agriculture Rural-Urban Commuting Area (RUCA) codes.[28] RUCA codes are calculated for each census tract based on population size, urbanization, and daily commuting patterns. Census

TABLE 1 Characteristics of census tracts by urban-rural categorization, United States, 2017 (n = 66,053)

Characteristic	Tract type				
	Urban core	Suburban	Large town	Small town/rural	All
No. of tracts (%)	47,236 (71.5)	6,655 (10.1)	6,122 (9.3)	6,040 (9.1)	66,053
No. of tracts with ≥1 tobacco-free food retailer (%)	34,251 (72.5)	4,445 (66.8)	4,271 (69.8)	4,417 (73.1)	47,384 (71.1)
Avg. no. food retailers	5.3	4.3	5.4	5.3	5.2
Avg. no. tobacco-free (%)	1.8 (32.9)	1.3 (30.2)	1.6 (28.5)	1.6 (30.0)	1.7 (32.0)
Sociodemographic characteristics					
Tract population, m (sd)	4,460 (2,015)	4,517 (1,895)	4,283 (1,647)	3,657 (1,533)	4,376 (1,946)
Median household income ($USD), m (sd)	64,7759 (33,126)	61,279 (22,063)	47,188 (14,988)	46,377 (12,574)	61,113 (30,273)
% vacant housing units	9.7	13.7	16.0	22.8	11.9
% non-Hispanic Black	15.7	6.8	9.1	6.7	13.4
% Hispanic or Latino	19.6	8.2	10.5	7.3	16.5
Region					
Northeast	10,066	937	681	663	12,347
Midwest	9,422	1,602	1,806	2,556	15,086
South	16,382	3,185	2,608	2,149	24,324
West	11,366	931	1,027	972	14,296

Note: Median household income is presented in 2017 inflation-adjusted dollars. The total number of food retailers was 343,581 and of these, 229,898 (66.9%) sold tobacco. The number of tobacco-free food retailers (n = 113,683) was calculated by subtracting the number of tobacco retailers from the total number of food retailers in each census tract.
Abbreviations: Avg., average; No., number.

tracts were classified into 1 of 4 categories based on the RUCA coding scheme similar to Rodriguez et al:[29] urban core, suburban, large town, or small town/rural.[30] Further description of this classification is in Table S1.

Covariates

We include several tract-level sociodemographic characteristics (median household income in 2017 adjusted US dollars, percent of the population that was non-Hispanic Black, percent of the population that was Hispanic or Latino, and percent of housing units that were vacant) as covariates from the 2013 to 2017 American Community Survey[31] given their associations with tobacco use, retailer density, and subsequent marketing in previous studies.[8,29,32–34] To aid in interpretation, median household income was scaled to tens of thousands of dollars and all other variables were scaled to tens of percentage points. Additionally, we categorized each census tract into 1 of the 4 dummy-coded US census defined regions (Northeast, Midwest, West, and South [reference group]). The south was selected as the reference group because it contained the largest number of census tracts.[35]

Analysis

The analytic sample included almost all census tracts in the US. We excluded census tracts with little to no residential population or without a RUCA classification (n = 768). Because we are specifically interested in tobacco-selling and tobacco-free food retailers, we also removed census tracts that did not have at least 1 food retailer (n = 6,112). Lastly, tracts with missing census data were dropped from the analysis (n = 98). The final analytic sample included 66,053 US census tracts encompassing 343,581 food retailers, 113,683 (33.1%) of which were classified as tobacco-free.

For both outcome variables, unadjusted models were estimated to determine whether there are differences in tobacco-free food retailer availability by rurality, and adjusted models were estimated to isolate the differences accounted for by rurality alone. Logistic regression models were estimated for the associations between tract-level rurality and whether a census tract had at least 1 tobacco-free food retailer (vs none). Linear regression models were used to estimate the associations between tract-level rurality and the percent tobacco-free food retailers. Analyses showed no variance inflation factors above 1.47, indicating no concerns of multicollinearity. Analyses were conducted using SAS 9.4 (SAS Institute, Cary, NC).

RESULTS

Census tract characteristics

A summary of census tract characteristics is in Table 1. Of the 66,053 census tracts analyzed, 47,236 (71.5%) were classified as urban cores,

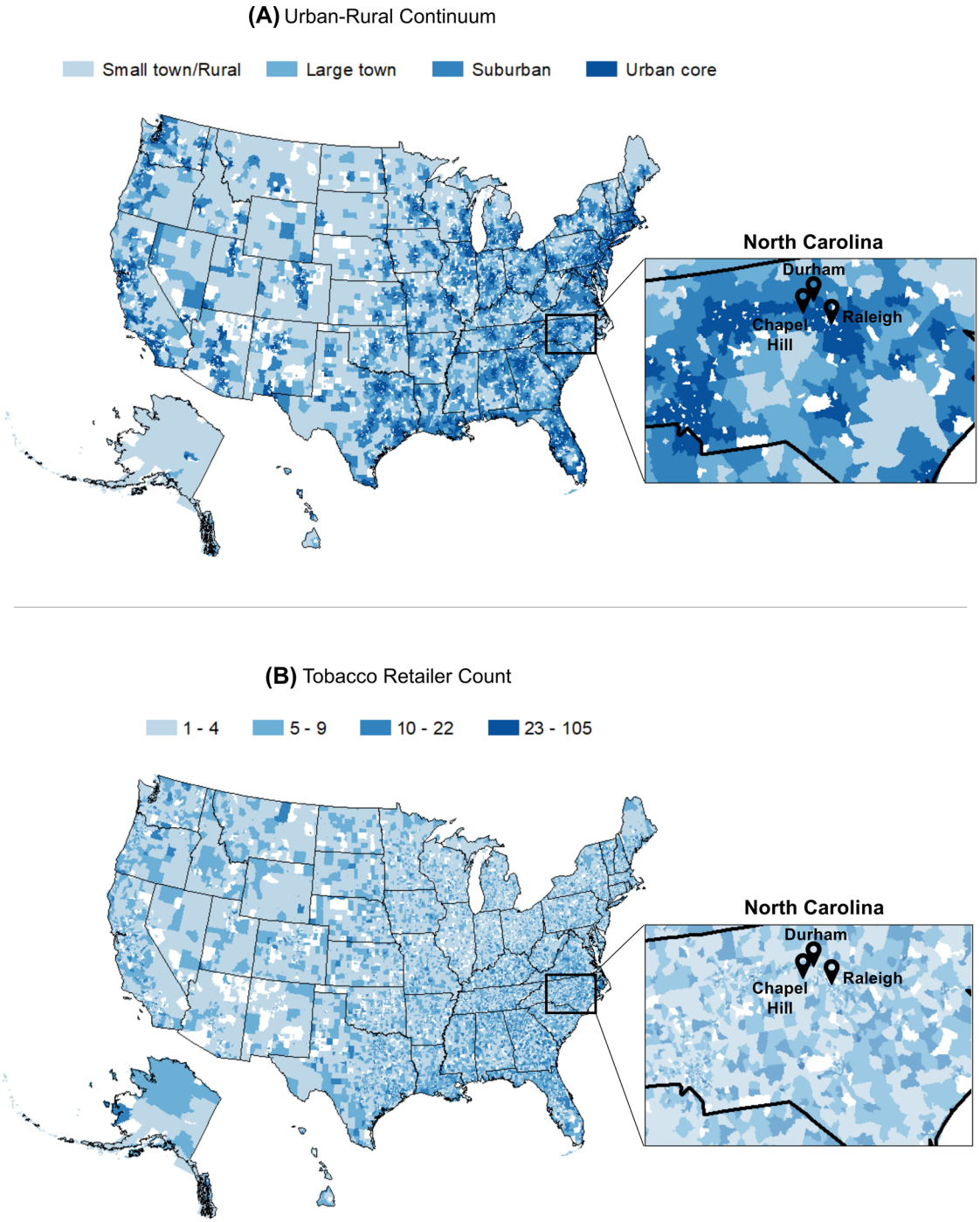

FIGURE 1 Urban-rural categorizations and tobacco retailer count, census tracts, United States, 2017 (N = 66,053)

6,655 (10.1%) were classified as suburbs, 6,122 (9.3%) were classified as large towns, and 6,040 (9.1%) were classified as small town/rural (Table 1 and Figure 1).

Presence of tobacco-free food retailers

The percent of census tracts with at least one tobacco-free food retailer was highest in small town/rural census tracts (73.1%) and lowest in suburban census tracts (66.8%). In unadjusted analyses (Table 2), suburban (OR = 0.76, 95% CI = 0.72, 0.81) and large town (OR = 0.88, 95% CI = 0.83, 0.93) census tracts were associated with lower odds of having at least one tobacco-free food retailer compared to urban core census tracts, whereas small town/rural census tracts did not significantly differ from urban core census tracts (OR = 1.03, 95% CI = 0.97, 1.10).

In analyses that adjusted for tract-level sociodemographic characteristics, suburban census tracts continued to be associated with lower

TABLE 2 Unadjusted and adjusted logistic regression estimating the odds of a census tract having at least 1 tobacco-free food retailer, United States, 2017 (n = 66,053)

	Unadjusted		Adjusted	
	OR	95% CI	aOR	95% CI
Tract type				
Urban core	*ref*	–	*ref*	–
Suburban	0.76	0.72, 0.81	0.77	0.73, 0.81
Large town	0.88	0.83, 0.93	0.97	0.91, 1.03
Small town/rural	1.03	0.97, 1.10	1.23	1.15, 1.32
Sociodemographic characteristics				
Median household income ($USD)	1.05	1.04, 1.05	1.03	1.02, 1.04
% vacant housing units	0.92	0.91, 0.94	0.94	0.92, 0.95
% non-Hispanic Black	0.95	0.95, 0.96	0.96	0.95, 0.97
% Hispanic or Latino	1.02	1.01, 1.03	1.01	1.00, 1.02
Region				
South	*ref*	–	*ref*	–
Northeast	1.26	1.20, 1.33	1.15	1.09, 1.21
Midwest	0.69	0.66, 0.73	0.65	0.62, 0.68
West	0.94	0.90, 0.99	0.89	0.76, 0.84

Note: Unadjusted models consist of 6 separate models with (1) tract type, (2) median household income, (3) percent vacant housing, (4) percent non-Hispanic Black, (5) percent Hispanic or Latino, and (6) region as predicters. The adjusted model controls for all variables in the table. Median household income was scaled to tens of thousands of dollars and all other control variables were scaled to tens of percentage points.
Abbreviations: 95% CI, 95% confidence interval; OR, odds ratio.

odds of having at least one tobacco-free food retailer compared to urban core census tracts (OR = 0.77, 95% CI = 0.73, 0.81), large town census tracts did not significantly differ (OR = 0.97, 95% CI = 0.91, 1.03), and small town/rural census tracts were associated with greater odds of having at least one tobacco-free food retailer compared to urban core census tracts (OR = 1.23, 95% CI = 1.15,1.32).

In both unadjusted and adjusted models, compared to census tracts in the South, census tracts in the Northeast were associated with greater odds of having at least one tobacco-free food retailer, whereas census tracts in the Midwest and West were associated with lower odds of having at least 1 tobacco-free food retailer.

Percent of tobacco-free food retailers

The percent of tobacco-free food retailers was highest in urban cores (32.9%) and lowest in large towns (28.5%). In unadjusted analyses (Table 3) of the percent of tobacco-free food retailers, suburban, large town, and small town/rural census tracts had a significantly smaller percent of tobacco-free food retailers compared to urban core census tracts (all $P<.001$). Compared to urban core census tracts, suburban census tracts also had 2.7 percentage points fewer tobacco-free food retailers ($P<.001$), large town census tracts had 4.5 percentage points fewer tobacco-free food retailers ($P<.001$), and small town/rural census tracts had 2.9 percentage points fewer tobacco-free food retailers ($P<.001$).

In adjusted analyses of the percent of tobacco-free food retailers, suburban census tracts had 2.3 percentage points fewer tobacco-free food retailers ($P<.001$) and large town census tracts had 1.9 percentage points fewer tobacco-free food retailers ($P<.001$) compared to urban core census tracts. We also found evidence suggesting that there was a smaller percentage of tobacco-free food retailers in small town/rural census tracts compared to urban core census tracts; however, this difference was not significant (B = −0.5, $P = .24$).

In both unadjusted and adjusted models, compared to census tracts in the South, census tracts in the Northeast and West had a greater percentage of food retailers that were tobacco-free, whereas census tracts in the Midwest did not significantly differ.

Sensitivity analyses

We additionally performed 2 sensitivity analyses using alternative urban-rural coding schemes and food retailer types. Our 4 category urbanicity/rurality measure is one of several existing classifications. To determine whether our results were sensitive to the rurality measure, we repeated our analyses using 2 RUCA coding schemes with 3 categories each[36,37] (Table S1). No directionality changes occurred for significant estimates. The statistical significance changed for a single estimate in the first sensitivity analysis with an alternative RUCA coding scheme:[36] in the unadjusted model, the odds of having at least 1

TABLE 3 Multiple linear regression estimating the association between urban-rural categories and percentage of tobacco-free food retailers, United States, 2017 (n = 66,053)

	Unadjusted		Adjusted	
	B	SE	B	SE
Tract type				
Urban core	*ref*	–	*ref*	–
Suburban	−2.70***	0.37	−2.29***	0.39
Large town	−4.45***	0.39	−1.90***	0.41
Small town/rural	−2.89***	0.39	−0.51	0.44
Sociodemographic characteristics				
Median household income ($USD)	1.66***	0.04	1.45***	0.04
% vacant housing units	−1.41***	0.11	0.32**	0.12
% non-Hispanic Black	−1.15***	0.05	−0.44***	0.06
% Hispanic or Latino	−0.22***	0.05	−0.08	0.06
Region				
South	*ref*	–	*ref*	–
Northeast	5.57***	0.31	3.11***	0.32
Midwest	−0.08	0.29	−0.55	0.30
West	4.86***	0.30	2.53***	0.32

Note: Unadjusted models consist of 6 separate models with (1) tract type, (2) median household income, (3) percent vacant housing, (4) percent non-Hispanic Black, (5) percent Hispanic or Latino, and (6) region as predictors. The adjusted model controls for all variables in the table. Median household income was scaled to tens of thousands of dollars and all other control variables were scaled to tens of percentage points.
Abbreviations: B, beta coefficient; SE, standard error.
*$P<.05$.
**$P<.01$.
***$P<.001$.

tobacco-free food retailer in small town/rural census tracts were significantly greater than in urban census tracts ($P = .03$), compared to insignificantly different in the main analysis. However, this different finding was not consistent in the sensitivity analysis with the second alternative RUCA coding scheme.[37]

We defined food retailers broadly, recognizing that individuals shop at varying store types. To evaluate whether the results were sensitive to our criteria for identifying food retailers, we removed specialty food retailers (eg, meat, fish/seafood, and fruit/vegetable markets) from the list. Specialty food retailers do not offer a comprehensive grocery selection and may require consumers to visit additional food retailers. No changes in directionality occurred for significant estimates. However, the statistical significance changed for one estimate in each adjusted model. In the first model, the odds of having at least one tobacco-free food retailer in large town census tracts were significantly less than urban census tracts (95% CI: 0.851, 0.959) and, in the second model, small town/rural census tracts had a significantly smaller percentage of tobacco-free food retailers ($P = .001$) compared to insignificant differences in the main analysis.

DISCUSSION

Across census tracts containing food retailers in the United States, we observed urban-rural differences in the availability of tobacco-free food retailers, measured as both the presence of any tobacco-free food retailers and the percent of retailers that are tobacco-free. However, the disparities were not consistent along the urban-rural continuum. While we expected tobacco-free food retailers to be least available in small town/rural census tracts, they were actually least available in suburban and large town census tracts.

This pattern may be due to the different store types available across urban and rural locations. We expected rural areas to be least likely to have a tobacco-free food retailer and to have a lower prevalence of tobacco-free food retailers because they are more likely than urban areas to have few retail food options, they typically have high smoking prevalence, and common tobacco retailers, such as convenience stores, dollar stores, and gas stations, tend to be primary food sources in rural areas.[38,39] Furthermore, compared to urban shoppers, individuals in rural areas are more likely to report shopping at dollar stores and mass merchandisers, which are also tobacco retailers.[40]

Our sensitivity analysis highlighted the possibility that rural areas may have a greater percentage of specialty food retailers (eg, meat, fish/seafood, and fruit/vegetable markets). After removing these retailers, small town/rural census tracts were still more likely to have one tobacco-free food retailer but had a lower percentage of tobacco-free food retailers than urban core census tracts. This finding indicates that although small town/rural census tracts are likely to have a tobacco-free food retailer, they may not have many. However, individuals report choosing to shop at specialty food retailers because of the high-quality

food and service[41,42] and individuals in rural areas report driving farther to access food than individuals in urban areas,[43] so individuals in rural areas may be willing to seek out specialty retailers even when few are available. Further research should investigate the prevalence of specialty food retailers, along with different store types, across the urban-rural continuum and their role as a tobacco-free food retailer in the community.

Our findings may also be partially due to how we operationalized urban and rural areas. Our hypothesis was driven by previous work that operationalized urbanicity/rurality as a dichotomy,[3,7,29,40] whereas our analysis disaggregated this dichotomy into 4 categories. Prior research indicates that dichotomizing areas into urban and rural can lead to the loss of meaningful information.[44,45] Across both models, and the sensitivity analysis with 3 categories, we found a similar pattern where urban cores and small town/rural census tracts were most likely to have a tobacco-free food retailer and also have the greatest prevalence of tobacco-free food retailers, while suburban and large town census tracts were less likely to have a tobacco-free food retailer along with a smaller prevalence of them. One feature that distinguishes suburban and large town census tracts in our study from urban cores and small town/rural census tracts are the high *and* consistent commuting patterns (Table S1). In general, suburban and large town areas may differ from urban cores and rural areas in that they are built around car ownership,[46] so retailer types may differ. This study highlights the importance of considering multiple gradients of urbanicity/rurality to identify nuances in place-based resource availability. Furthermore, this study highlights the need to address the understudied variation between and within urban-rural categories.

After controlling for demographic variables, the odds of having at least one tobacco-free food retailer were no longer lower in large towns and increased in small town/rural census tracts compared to urban cores. Similarly, the percentage of tobacco-free food retailers was no longer smaller in small town/rural census tracts compared to urban cores and, though the percentage remained smaller in suburban and large town census tracts, the coefficients decreased. These adjusted associations indicate that the relationship between tobacco-free food retailer availability and urbanicity/rurality is partially attributable to area sociodemographic characteristics. This finding supports the association between the tobacco retail environment and place-based sociodemographic characteristics found in previous research.[8,29,32–34] This also suggests that urbanicity/rurality alone cannot explain variation in tobacco-free food retailer availability.

Tobacco-free food retailers may offer a protective effect for communities, providing a space to purchase food and essential items without tobacco products and advertising present. Research indicates that consumers across the urban-rural continuum prefer tobacco products to be hidden from view or not allowed in pharmacies and grocery stores at all[47] and consumers in focus groups voiced that they were more likely to shop at a store that discontinued its tobacco sales.[48] When CVS discontinued the sale of tobacco products in 2014, tobacco purchasing at both individual and household levels dropped among states with large market shares of CVS pharmacies.[49] Moreover, cessation attempts among smokers living in high-density CVS counties increased.[18] The case of CVS indicates that tobacco-free food retailers have the potential to decrease tobacco use at a population level. Joining CVS in discontinuing tobacco sales, Schnucks Markets (grocery chain) pledged to cease tobacco sales in 2020 while simultaneously offering store rewards for tobacco cessation aid purchases.[50] Regional chains that discontinue selling tobacco may be disproportionately located in neighborhoods defined by specific sociodemographic characteristics.[51] Research indicates that tobacco retailer density is greater in areas that were historically redlined, disproportionately exposing some racial and ethnic groups to tobacco products and marketing.[52] Future research should consider how trends in tobacco-free food retailer availability relate to tobacco retailer availability, how inequities are changing over time, and if changing availability is associated with tobacco use behaviors.

While tobacco-free food retailer availability may act as an important, health-promoting community resource, it exists alongside many other place-based determinants of tobacco use. Though tobacco-free food retailers may be similarly or slightly more available in small town/rural census tracts, these areas face additional barriers to avoiding tobacco use. Rural areas are less likely to have resources for smoking cessation, less likely to have smoke-free air laws and other antismoking policies, and cultural norms surrounding tobacco in rural areas typically encourage use.[53] The tobacco industry has specifically targeted rural populations, particularly young men, with the imagery of rugged cowboys and "manly" archetypes in tobacco advertising.[54,55] Future interventions in rural areas should address tobacco use with a multipronged approach, that includes promoting tobacco-free food retailer availability and addressing the rural-specific barriers noted here.

There are some limitations within this study. First, we used SIC and NAICS codes to categorize food retailers. These codes are chosen by business owners and may be subject to selection error. Additionally, the tobacco retailer identification protocol used in this study identifies *likely* tobacco retailers based on store types and names, but tobacco sales at these retailers are not verified. This may have led to misclassification of some retailers as tobacco-selling. However, we do not expect our retailer identification to be systematically biased, and recent retailer audit research has validated similar samples of likely tobacco retailers.[55] We performed all analyses at the census tract level, but other geographical units, or person-based measures like activity spaces, might better capture daily travel and food shopping patterns. Future research should also focus on the co-occurrence of tobacco product availability with healthy and unhealthy food options and assess how this relationship may vary by store type and across the urban-rural continuum.

The findings of this study emphasize the importance of measuring urban/rural differences in retail availability on a continuum along with the possibility that store type and characteristics of an area may be important factors associated with tobacco-free food retailer availability. The tobacco retail environment is often characterized by the number of retailers that sell tobacco products within an area. This characterization frames the tobacco retail environment in terms of where

individuals can find tobacco but does not fully capture stores where consumers can purchase essential items without being exposed to tobacco products and marketing (eg, tobacco-free food retailers). Our study introduces a measure of the tobacco and food environment that may address this gap and can be used to assess and promote healthy retail environments.

DISCLOSURES

AYK serves as a paid expert consultant in litigation against tobacco companies.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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