Supplement C. Evidence Table of Records Assessing Neighborhood-Level Inequities in Tobacco Retailer Availability, N=58

Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
Adachi-Mejia 2012[1]	Cross-sectional	USA (contiguous)	Census tract (N=3,456)	Pearson correlation	U.S. Census (2000) Proportion population Black	North American Industry Classification System (NAICS) Association (2007)	N=306,695 Tobacco stores, grocery stores, gas stations and convenience stores based on primary NAICS activity	Adaptive bandwidth kernel density estimation (bandwidth maximum: 25 kilometer radius (sparsely populated regions) or 1000 population; cell size = 0.5-mile pixels): count of tobacco retailers per 1000 people (assigned at pixel)	ES1: r=0.27 (p-value not specified)	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: No NA2: Yes Total: 5
					Proportion population Hispanic			Adaptive bandwidth kernel density estimation (bandwidth maximum: 25 kilometer radius (sparsely populated regions) or 1000 population; cell size = 0.5-mile pixels): count of tobacco retailers per 1000 people (assigned at pixel)	ES2: r=0.26 (p-value not specified)	
					Proportion of families with income below the poverty level			Adaptive bandwidth kernel density estimation (bandwidth maximum: 25 kilometer radius (sparsely populated regions) or 1000 population; cell size = 0.5-mile pixels): count of tobacco retailers	ES3: r=0.39 (p-value not specified)	

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								per 1000 people (assigned at pixel)		
Adibe 2019[2]	*Cross-sectional*	*Ohio* *USA*	*Census tract (N=2,937)*	*Negative binomial spatial regression*	*5-year American Community Survey (2016)* • *Percent African American (dichotomized into "High" vs. "Low" prevalence if 15% or more of the population was African American)* • *Percent Hispanic (dichotomized into "High" vs. "Low" prevalence if 15% or more of the population was Hispanic)* • *Percent Asian (dichotomized into "High" vs. "Low" prevalence if 15% or more of the population was Asian)* • *Poverty (dichotomized into "High" vs. "Low" prevalence if 15.4% or more of the population was below the poverty level)*	*Licensed cigarette retailers: Ohio's county auditor offices (September 2017-December 2017)* *Hookah cafes and e-cigarette retailers: six Internet directories (i.e., Yelp, E-Cigarette-Store-Reviews.com, Hookah-Hookah, the Yellow Pages, Better Business Bureau, Hoover directories) (December 2017-April 2018)*	*N=11,389 (11,065 cigarette licenses and 327 vape/hookah retailers and cafes – 3 retailers omitted for analyses)*	*Count of tobacco retailers per 1,000 people*	*No unadjusted effect sizes reported.* *"There were more (from 1.4-1.9 times as many) retailers per capita in high-poverty vs. low-poverty tracts. […] Density was also greater in tracts with a high (vs. low) prevalence of African Americans (1.1 times as many) and Hispanics (1.2 times as many)." p.1*	*2: Yes* *11: Yes* *13: No* *18: Yes* *20: Yes* *NA1: Yes* *NA2: Yes* *Total: 6*
Anesetti-Rothermel 2020[3]	Cross-sectional	Washington DC; DC metropolitan statistical area (MSA)	Census tract (DC=177; DC MSA=1,428)	Spearman correlation	American Community Survey (2011-2015)	Dun and Bradstreet's Hoovers database (2015) and using North American	DC (N=743) DC MSA (N=4,539) Ten NAICS categories: beer, wine	Adaptive bandwidth kernel density estimation (bandwidth maximum: 1,000 people; spatial	ES1: DC: R_S: -0.38, p=0.00; spatially adjusted p=0.00 ES5: DC MSA: R_S: 0.10, p=0.00; spatially adjusted p=0.12	2: Yes 11: Yes 13: No

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		USA			Percent of non-Hispanic African American residents	Industry Classification System (NAICS) categories	and liquor stores; supermarkets and other grocery stores; convenience stores; pharmacies and drug stores; gasoline stations with convenience stores; other gasoline stations; department stores; discount department stores; tobacco stores; and warehouse clubs and supercenters	resolution: 250 meters): count of tobacco retailers per 1,000 daytime population (averaged across pixels within tracts)		18: Yes 20: Yes NA1: No NA2: Yes Total: 5
				Bivariate spatial lag regression	Percent of non-Hispanic African American residents			Adaptive bandwidth kernel density estimation (bandwidth maximum: 1,000 people; spatial resolution: 250 meters): count of tobacco retailers per 1,000 daytime population (averaged across pixels within tracts)	ES9: DC: Coefficient: -0.013, SE: 0.006, p=0.018 ES13: DC MSA: Coefficient: 0.334, SE: 0.29, p=0.25	
				Spearman correlation	Percent of Hispanic residents			Adaptive bandwidth kernel density estimation (bandwidth maximum: 1,000 people; spatial resolution: 250 meters): count of tobacco retailers per 1,000 daytime	ES2: DC: R_S: 0.34, p=0.00; spatially adjusted p=0.00 ES6: DC MSA: R_S: 0.19, p=0.00; spatially adjusted p=0.00	

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								population (averaged across pixels within tracts)		
				Bivariate spatial lag regression	Percent of Hispanic residents			Adaptive bandwidth kernel density estimation (bandwidth maximum: 1,000 people; spatial resolution: 250 meters): count of tobacco retailers per 1,000 daytime population (averaged across pixels within tracts)	ES10: DC: Coefficient: 0.058, SE: 0.022, p=0.007 E14: DC MSA: Coefficient: 1.716, SE: 0.621, p=0.006	
				Spearman correlation	Percent of families living below the federal poverty level			Adaptive bandwidth kernel density estimation (bandwidth maximum: 1,000 people; spatial resolution: 250 meters): count of tobacco retailers per 1,000 daytime population (averaged across pixels within tracts)	ES3: DC: R_S: -0.15, p=0.04; spatially adjusted p=0.02 ES7: DC MSA: R_S: 0.11, p=0.00; spatially adjusted p=0.00	
				Bivariate spatial lag regression	Percent of families living below the federal poverty level			Adaptive bandwidth kernel density estimation (bandwidth maximum: 1,000 people; spatial resolution: 250 meters): count of tobacco retailers per 1,000 daytime	ES11: DC: Coefficient: -0.012, SE: 0.013, p=0.367 ES15: DC MSA: Coefficient: 3.513, SE: 1.073, p=0.001	

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								population (averaged across pixels within tracts)		
				Spearman correlation	Total number of jobs			Adaptive bandwidth kernel density estimation (bandwidth maximum: 1,000 people; spatial resolution: 250 meters): count of tobacco retailers per 1,000 daytime population (averaged across pixels within tracts)	ES4: DC: R_S: 0.32, p=0.00; spatially adjusted p=0.12 ES8: DC MSA: R_S: 0.29, p=0.00; spatially adjusted p=0.00	
Berg 2020[4]	*Cross-sectional*	*Metropolitan statistical areas (Atlanta-Sandy Springs-Roswell [Georgia]; Boston-Cambridge-Newton [Massachusetts]; Minneapolis-St. Paul-Bloomington [Minnesota]; Oklahoma City [Oklahoma]*	*Census tracts (N=4,307)*	*Logistic regression (stratified by metropolitan statistical areas)*	*American Community Survey (2013-2017)* • *Percent non-White (quartiles)* *Median household income (quartiles)*	*Convenience stores: ReferenceUSA (December 2018); Dun & Bradstreet (November 2018)*	*Convenience stores (N=10,777): "predominately sell vaping and other tobacco products" (p. 2)*	*Presence (vs. absence) of at least convenience store*	*No unadjusted effect sizes reported.* *"Convenience stores more likely resided in tracts with lower percentages of non-Whites in Atlanta and Boston; lower incomes in Atlanta, Boston, San Diego, and Seattle; and higher percentages of youth in Atlanta, Boston, and Minneapolis." p.1*	*2: Yes* *11: Yes* *13: No* *18: Yes* *20: Yes* *NA1: No* *NA2: Yes* *Total: 5*

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		; San Diego-Carlsbad [California]; and Seattle-Tacoma-Bellevue [Washington]) *USA*								
Bostean 2022[5]	Cross-sectional	California USA	Census tracts (N=7,888)	Bivariate correlations	5-year American Community Survey (2016) Percent foreign-born Latinx (born outside the US)	DataAxle, formerly InfoUSA (2018) using primary SIC codes	N=20,990 Tobacco retailers (gas stations, convenience stores, liquor stores, tobacco shops [excluding supermarkets and drugs stores])	Count of tobacco retailers per 10 miles of roadway	ES3: 0.230	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: No NA2: Yes Total: 5
				Bivariate analyses (ANOVA)	Percent foreign-born Latinx (tertiled into low, medium, high)			Count of tobacco retailers per 10 miles of roadway	ES1: Low: 1.0 Medium: 1.4 High: 2.1 p<0.001	
				Bivariate correlations	Percent Latinx			Count of tobacco retailers per 10 miles of roadway	ES5: 0.147	
				Bivariate correlations	Percent non-Latinx foreign-born Asian (excludes Native Hawaiian, Pacific Islanders)			Count of tobacco retailers per 10 miles of roadway	ES4: 0.085	

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				Bivariate analyses (ANOVA)	Percent non-Latinx foreign-born Asian (excludes Native Hawaiian, Pacific Islanders)			Count of tobacco retailers per 10 miles of roadway	ES2: Low: 1.4 Medium: 1.4 High: 1.8 p<0.001	
				Bivariate correlations	Percent Asian			Count of tobacco retailers per 10 miles of roadway	ES6: 0.131	
				Bivariate correlations	Percent non-Latinx/Hispanic White only			Count of tobacco retailers per 10 miles of roadway	ES7: -0.269	
				Bivariate correlations	Median household income			Count of tobacco retailers per 10 miles of roadway	ES8: -0.172	
				Bivariate correlations	Percent less than a high school diploma			Count of tobacco retailers per 10 miles of roadway	ES9: 0.146	
Caryl 2021[6]	Cross-Sectional	Scotland United Kingdom	Data zones (N=6,976)	Regressions to mean tobacco outlet density	Scottish Government's Scottish Index of Multiple Deprivation (2016)	Register of Tobacco and Nicotine Vapour Product Retailers (2016)	N=9,030 All tobacco retailers	Kernel density estimation (100x100 meter grids; 800 meter radius of each cell): count of tobacco outlets per 1,000 population per square kilometer	ES1: Most deprived: 12.055 Least deprived: 4.627 Slope Index of Inequality: -1.486 Relative Index of Inequality: 2.605 p=0.000	2: Yes 11: Yes 13: Yes 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 7
Chaitoⁿ 2013[7]	*Cross-sectional*	*Ontario* *Canada*	*Dissemination area (N=18,922)*	*Logistic regression*	*Canadian Census (2006)* • *Neighborhood deprivation index (Percentage age 25+ without high school graduation; Percentage lone parent*	*Ontario Ministry of Health and Long-Term Care Tobacco Information System database (June 2011)*	*N = 11,113* *All tobacco retailers*	*Count of tobacco retailers per 1,000 people over age 15*	*No unadjusted effect sizes reported.* *"Tobacco outlets were more likely to be located in areas that had high neighbourhood deprivation, in both rural and*	*2: Yes* *11: Yes* *13: Yes* *18: Yes* *20: Yes*

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					families; Percentage of families receiving government transfer payments; Percentage 15+ unemployed; Percentage living below the low income cut off; Percentage of homes needing major repair) • *Percent immigrant population* • *Percent blue-collar workers*	*Supplemented with Yellow Pages online directory* *Ground-truthed retailers to verify cigarette sales with clerk*			*urban areas. Outlets were less likely to be located in areas with high immigrant populations in urban areas, with the reverse being true for rural areas." p.7299*	*NA1: Yes* *NA2: Yes* *Total: 7*
Chuang 2005[8]	Cross-sectional (pooled)	Northern California (four cities, not specified) USA	"Neighborhoods" defined by census tract, census block group, or combination of two (N=82)	Chi^2 tests	Census (1980, 1990) Calculated socioeconomic status score based on principal component analysis: percentage less than high school education, percentage blue collar workers, percentage unemployed, median annual family income, and median housing value (standardized by city) Scores were summed and then tertiled based on distribution each year where higher scores represent higher	Business listing addresses from telephone books for the survey years (1979–1990 as part of Stanford heart disease prevention program)	N not specified Convenience stores	Count of convenience stores per square mile (Tertiled based on the distribution in each survey year)	ES1: Percentage of neighborhoods having a high density of convenience stores Low SES: 47.6% Middle SES: 39.8% High SES: 12.6% Chi^2 p-value (<0.0001)	2: Yes 11: No 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 5

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					neighborhood socioeconomic status (SES)					
Craigmile 2021[9]	Cross-sectional	Ohio USA	Census tracts (N=2,937)	Negative binomial model	American Community Survey 5-year Estimates (2016) 'High' vs. 'Low' prevalence of African-Americans (15% cut-off)	Active licensed cigarette retailers: Ohio's county auditor offices (fall of 2017) Hookah cafes and vape shops: Internet directories (e.g., Yelp, Yellowpages.com)	N=11,389 Tobacco retailers (n=11,065 retailers with cigarette licenses; n=327 vape/hookah stores. Note: 3 retailers excluded from analysis, but type not specified)	Mean log count of tobacco retailers per 1000 people (adding one to the retailer count to guard against taking the log of a zero count)	ES4: Rate Ratio: 1.12 No statistical significance reported.	2: Yes 11:Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
				Negative binomial model	'High' vs. 'Low' prevalence of Hispanics (15% cut-off)				ES5: Rate Ratio: 1.19 No statistical significance reported.	
D'Alessandro 2016[10]	Cross-sectional	King County (Washington) USA	Census tract (N=397)	Pearson correlation	5-Year American Community Survey (2010-2014) Median household income	Washington State Department of Health tobacco retail list (2015)	N=1,865 All tobacco outlets	Count of tobacco retailers per 1,000 people	ES1: r: -0.39, p<0.001	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
					Percent of the population with a high school degree or higher			Count of tobacco retailers per 1,000 people	ES2: r: -0.26, p<0.001	

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					Percentage of the population that identify as White			Count of tobacco retailers per 1,000 people	ES3: r: -0.17, p<0.001	
					Percentage of the population that identify as African-American			Count of tobacco retailers per 1,000 people	ES4: r: 0.21, p<0.001	
					Percentage of the population that identify as Hispanic/Latino			Count of tobacco retailers per 1,000 people	ES5: r: 0.15, p<0.001	
Dalglish 2013[11]	Cross-sectional	South-East Queensland Australia	State suburbs (N not specified)	Pearson correlation coefficient	Australian Bureau of Statistics (ABS) Socioeconomic Indexes for Areas (SEIFA), Index of Relative Socio-economic Advantage and Disadvantage (IRSAD): relative measure of socioeconomic advantage "derived from various census measures including household income, occupation, internet connection and level of education attained" (p.372) where IRSAD decile 10=advantage and IRSAD decile 1=disadvantage	Ground-truthing (September and October 2010): "To collect the data, the auditor travelled systematically by foot through each of the survey areas and identified all retail outlets. The auditor then entered each outlet to establish if they sold cigarettes." p.372	N=56 Retailers that sold cigarettes (as confirmed by ground-truthing)	Count of tobacco retailers	ES1: r: 0.93, p=0.003	2: Yes 11: No 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 5
Duncan 2014[12]	Cross-sectional	Boston, Massachusetts USA	Census tract (N=167)	Spearman correlation	2010 U.S. census race/ethnicity demographic estimates; 2006-2010 American Community Survey	Cigarette and Tobacco Excise Unit of the Commonwealth of Massachusetts'	N=1025 All licensed tobacco retailers	Tobacco retailers per square kilometer	ES1: Continuous: R_s: -0.1050, p=0.1770, spatially adjusted p=0.4512	2: Yes 11: Yes 13: No

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					estimates of federal poverty level % non-Hispanic black residents (continuous; categorical as "predominantly black neighborhoods" for tracts with >60% black residents)	Department of Revenue tobacco retailer list (October 2010-September 2012)			ES4: Categorical: R_s: -0.0562, p=0.4703, spatially adjusted p=0.6232	18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
				Spatial lag regression	% non-Hispanic black residents (continuous; categorical as "predominantly black neighborhoods" for tracts with >60% black residents)			Tobacco retailers per square kilometer (natural logarithm transformation with a transformation offset of 0.001)	ES7: Continuous: Coefficient: 0.003, SE: 0.007, p=0.640 ES10: Categorical: Coefficient: 0.203, SE: 0.527, p=0.701	
				Spearman correlation	Percentage of Hispanic residents (continuous; categorical as "predominantly Hispanic neighborhoods" for tracts with >60% Hispanic residents)			Tobacco retailers per square kilometer	ES2: Continuous: R_s: 0.0312, p=0.6889, spatially adjusted p=0.8018 ES5: Categorical: R_s: 0.2005, p=0.0094, spatially adjusted=not applicable, could not be computed	
				Spatial lag regression	Percentage of Hispanic residents (continuous; categorical as "predominantly Hispanic neighborhoods" for tracts with >60% Hispanic residents)			Tobacco retailers per square kilometer (natural logarithm transformation with a transformation offset of 0.001)	ES8: Continuous: Coefficient: 0.009, SE: 0.012, p=0.432 ES11: Categorical: Coefficient: 1.270, SE: 1.007, p=0.207	
				Spearman correlation	Percentage of families below the federal poverty level (continuous;			Tobacco retailers per square kilometer	ES3: Continuous: R_s: 0.1322, p=0.0884, spatially adjusted p=0.2048	

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					categorical as "high-poverty neighborhoods" for tracts with at least 20% of families living in poverty)				ES6: Categorical: R_s: -0.1279, p=0.0995, spatially adjusted p=0.1377	
				Spatial lag regression	Percentage of families below the federal poverty level (continuous; categorical as "high-poverty neighborhoods" for tracts with at least 20% of families living in poverty)			Tobacco retailers per square kilometer (natural logarithm transformation with a transformation offset of 0.001)	ES9: Continuous: Coefficient: 0.002, SE: 0.012, p=0.841 ES12: Categorical: Coefficient: 0.213, SE: 0.371, p=0.566	
Fakunle 2010[13]	Cross-sectional	Stratified analyses for Bergen and Salem Counties (New Jersey) USA	Census tract (N=1,938)	Analysis of Variance (ANOVA)	Census (2000) Median household income (quartiles)	New Jersey Department of the Treasury (2004)	N=13,984 All retailers licensed to sell tobacco as a retail product	Count of tobacco retailers per 10 kilometers of roadway	ES1: Salem County Q1: <$37,235 (μ: 3.64) Q2: <$47,793 (μ: 1.36) Q3: <$53,516 (μ: 0.47) Q4: >/=$53,516 (μ: 0.24) F[3,20]=8.03, p<0.01 ES2: Bergen County Q1: <$51,159 (μ: 8.52) Q2: <$67,000 (μ: 3.85) Q3: <$85,351 (μ: 2.32) Q4: >/=$85,351 (μ: 0.87) F[3,159]=56.49, p<0.001 Post-hoc Tukey tests were used to examine pairwise differences among the means but effect sizes were not reported. Salem County: "The tests revealed that…the first quartile for median household income	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6

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									(signifying the lowest 25% of median household incomes) had significantly higher tobacco outlet [density] than the other three quartiles" (p. 253). Bergen County: "The first quartile for median household income had a significantly higher tobacco outlet density than the other three quartiles" (p. 255).	
					Percentage of African American residents (quartiles)				ES3: Salem County Q1: </=1.53% (μ: 1.20) Q2: >1.53% (μ: 0.29) Q3: >11.50% (μ: 0.66) Q4: >23.56% (μ: 3.56) F[3,20]=6.36, p<0.01 ES4: Bergen County Q1: </=0.49% (μ: 2.63) Q2: >0.49% (μ: 3.49) Q3: >1.17% (μ: 4.10) Q4: >3.35% (μ: 5.17) F[3,159]=3.03, p<0.05 Post-hoc Tukey tests were used to examine pairwise differences among the means but effect sizes were not reported. Salem County: "The tests revealed that the fourth quartile for African American population percentage…(signifying the	

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
									highest 25% of population percentages)…had significantly higher tobacco outlet [density] than the other three quartiles" (p. 253). Bergen County: "The fourth quartile's tobacco outlet density was only significantly higher than that of the first quartile" (p. 255).	
					Percentage of Latino residents (quartiles)				ES5: Salem County Q1: </=1.37% (μ: 0.98) Q2: >1.37% (μ: 0.56) Q3: >2.33% (μ: 0.52) Q4: >4.58% (μ: 3.64) F[3,20]=6.77, p<0.01 ES6: Bergen County Q1: </=4.17% (μ: 0.86) Q2: >4.17% (μ: 2.84) Q3: >8.16% (μ: 4.94) Q4: >13.71% (μ: 6.77) F[3,159]=23.89, p<0.001 Post-hoc Tukey tests were used to examine pairwise differences among the means but effect sizes were not reported. Salem County: "The tests revealed that the fourth quartile for…Latino population percentage…(signifying the highest 25% of population percentages)…had significantly	

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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
									higher tobacco outlet [density] than the other three quartiles" (p. 253). Bergen County: "The fourth quartile's tobacco outlet density was only significantly higher than that of the first and second quartile" (p. 255).	
Fakunle 2016[14]	Cross-sectional	Stratified analyses for Baltimore City and Prince George's County (Maryland) USA	Census tracts (Baltimore City, N=198; Prince George's County, N=218) Counties described as "…similar racial concentrations yet differing income levels…" (p. 35)	T-test Also reports interaction between counties and each sociodemographic variable (i.e., median household income, % Black, % Hispanic, % with less than a high school diploma)	Decennial Census (2010), population data for outcome variable American Community Survey (2007-2011), sociodemographic data Median household income	Maryland Judiciary Business License (2013)	N not specified. All retailers with permit to sell tobacco.	Count of tobacco retailers per 1,000 people	ES2: Baltimore City: β: -0.022, p=0.004 ES6: Prince George's County: β: -0.009, p=0.001	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
				Spatial lag regression	% Black				ES3: Baltimore City: β: 0.001, p=0.001 ES7: Prince George's County: β: 0.001, p=0.001	
				Spatial lag regression	% Hispanic				ES4: Baltimore City: β: 0.024, p=0.355 ES8: Prince George's County: β: 0.004, p=0.929	

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
				Spatial lag regression	% with less than a high school diploma				ES5: Baltimore City: β: 0.079, p=0.069 ES9: Prince George's County: β: 0.040, p=0.069	
Fakunle 2019[15]	Cross-sectional	Stratified analyses for Baltimore County, Howard County, Montgomery County, Lower Eastern Shore (Dorchester County, Somerset County, Wicomico County, Worcester County), Western Maryland (Allegany County, Garret County, Washington County) (Maryland) USA	Census tract (N dependent on model) Counties described as "…similar White populations…" (p. 409)	Spatial lag Poisson regression	American Community Survey (2011-2015) Percentage of individuals who identify as White (scaled to 10%)	Maryland State Licensing Bureau (April 2017)	N=2,827 All retailers with active cigarette, special cigarette, or other tobacco product or tobacconist license	Count of tobacco retailers per 1000 people	Baltimore County (N=211) ES1: Exponentiated B: 1.02, p<0.001 ES2: Spatially lagged exponentiated B: 0.96, p<0.001 Howard County (N=55) ES13: Exponentiated B: 0.87, p<0.001 ES14: Spatially lagged exponentiated B: 1.02, p<0.001 Lower Eastern Shore (N=50) ES25: Exponentiated B: 1.24, p<0.001 ES26: Spatially lagged exponentiated B: 1.44, p<0.001 Montgomery County (N=215) ES37: Exponentiated B: 1.00, p=0.003 ES38: Spatially lagged exponentiated B: 0.97, p<0.001 Western Maryland (N=62) ES49: Exponentiated B: 1.13, p<0.001 ES50: Spatially lagged exponentiated B: 0.93, p<0.001	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
					Median household income (scaled to $10,000 and expressed in 2015 inflation-adjusted dollars)				Baltimore County (N=211) ES3: Exponentiated B: 0.93, p<0.001 ES4: Spatially lagged exponentiated B: 0.79, p<0.001 Howard County (N=55) ES15: Exponentiated B: 0.95, p<0.001 ES16: Spatially lagged exponentiated B: 1.09, p<0.001 Lower Eastern Shore (N=50) ES27: Exponentiated B: 1.00, p<0.001 ES28: Spatially lagged exponentiated B: 1.07, p<0.001 Montgomery County (N=215) ES39: Exponentiated B: 0.94, p<0.001 ES40: Spatially lagged exponentiated B: 0.92, p<0.001 Western Maryland (N=62) ES51: Exponentiated B: 0.85, p<0.001 ES52: Spatially lagged exponentiated B: 0.90, p<0.001	
					Percentage of individuals 25 years and over who obtained at least a Bachelor's degree (scaled to 10%)				Baltimore County (N=211) ES5: Exponentiated B: 0.85, p<0.001 ES6: Spatially lagged exponentiated B: 0.82, p<0.001 Howard County (N=55)	

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
									ES17: Exponentiated B: 0.96, p<0.001 ES18: Spatially lagged exponentiated B: 0.83, p<0.001 Lower Eastern Shore (N=50) ES29: Exponentiated B: 1.32, p<0.001 ES30: Spatially lagged exponentiated B: 1.81, p<0.001 Montgomery County (N=215) ES41: Exponentiated B: 1.05, p<0.001 ES42: Spatially lagged exponentiated B: 0.96, p<0.001 Western Maryland (N=62) ES53: Exponentiated B: 0.94, p<0.001 ES54: Spatially lagged exponentiated B: 0.69, p<0.001	
					Percentage of individuals 16 years and older who are actively in the labor force (scaled to 10%)				Baltimore County (N=211) ES7: Exponentiated B: 0.93, p<0.001 ES8: Spatially lagged exponentiated B: 0.68, p<0.001 Howard County (N=55) ES19: Exponentiated B: 0.69, p<0.001 ES20: Spatially lagged exponentiated B: 0.95, p<0.001 Lower Eastern Shore (N=50)	

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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
									ES31: Exponentiated B: 1.00, p=0.61 ES32: Spatially lagged exponentiated B: 0.91, p<0.001 Montgomery County (N=215) ES43: Exponentiated B: 1.04, p<0.001 ES44: Spatially lagged exponentiated B: 2.19, p<0.001 Western Maryland (N=62) ES55: Exponentiated B: 1.00, p=0.92 ES56: Spatially lagged exponentiated B: 0.73, p<0.001	
					Gini index of income inequality (scaled to 1%)				Baltimore County (N=211) ES9: Exponentiated B: 1.02, p<0.001 ES10: Spatially lagged exponentiated B: 0.97, p<0.001 Howard County (N=55) ES21: Exponentiated B: 1.01, p<0.001 ES22: Spatially lagged exponentiated B: 2.40, p<0.001 Lower Eastern Shore (N=50) ES33: Exponentiated B: 1.20, p<0.001 ES34: Spatially lagged exponentiated B: 1.12, p<0.001 Montgomery County (N=215)	

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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									ES45: Exponentiated B: 1.05, p<0.001 ES46: Spatially lagged exponentiated B: 1.04, p<0.001 Western Maryland (N=62) ES57: Exponentiated B: 1.03, p<0.001 ES58: Spatially lagged exponentiated B: 1.05, p<0.001	
					Total number of vacant housing units (scaled to 100 units)				Baltimore County (N=211) ES11: Exponentiated B: 0.82, p<0.001 ES12: Spatially lagged exponentiated B: 1.48, p<0.001 Howard County (N=55) ES23: Exponentiated B: 1.59, p<0.001 ES24: Spatially lagged exponentiated B: 0.93, p<0.001 Lower Eastern Shore (N=50) ES35: Exponentiated B: 1.02, p<0.001 ES36: Spatially lagged exponentiated B: 1.04, p<0.001 Montgomery County (N=215) ES47: Exponentiated B: 1.75, p<0.001 ES48: Spatially lagged exponentiated B: 2.30, p<0.001 Western Maryland (N=62)	

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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									ES59: Exponentiated B: 0.99, p<0.001 ES60: Spatially lagged exponentiated B: 0.99, p<0.001	
Fakunle 2021[16]	Cross-sectional	Stratified analyses for Baltimore County, Howard County, Montgomery County, Lower Eastern Shore (Dorchester County, Somerset County, Wicomico County, Worcester County), Western Maryland (Allegany County, Garret County, Washington County) (Maryland) USA	Census tract (N dependent on model) "Areas with high-Black and high-White population percentages" with "similar magnitudes of socioeconomic status" (p. 4)	Spatial lag Poisson regression	American Community Survey (2011-2015) Percentage of individuals who identify as White (scaled to 10%)	Maryland State Licensing Bureau (April 2017)	N=2,830 All retailers with active cigarette, special cigarette, or other tobacco product or tobacconist license as of April 30, 2017	Count of tobacco retailers per 10 km of roadway	Only has unadjusted results reported for Western Maryland (N=62). ES1: Exponentiated B: 0.72, p<0.001 ES2: Spatially lagged exponentiated B: 0.69, p<0.001	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
					Median household income (scaled to				ES3: Exponentiated B: 0.84, p<0.001	

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					$10,000 and expressed in 2015 inflation-adjusted dollars)				ES4: Spatially lagged exponentiated B: 0.90, p<0.001	
					Percentage of individuals 25 years and over who obtained at least a Bachelor's degree (scaled to 10%)				ES5: Exponentiated B: 1.04, p<0.001 ES6: Spatially lagged exponentiated B: 1.00, p=0.99	
					Percentage of individuals 16 years and older who are actively in the labor force (scaled to 10%)				ES7: Exponentiated B: 0.89, p<0.001 ES8: Spatially lagged exponentiated B: 1.10, p<0.001	
					Gini index of income inequality (scaled to 1%)				ES9: Exponentiated B: 1.04, p<0.001 E10: Spatially lagged exponentiated B: 1.03, p<0.001	
					Total number of vacant housing units (scaled to 100 units)				ES11: Exponentiated B: 0.88, p<0.001 E12: Spatially lagged exponentiated B: 0.91, p<0.001	
Galiatsatos 2018[17]	Cross-sectional	Baltimore, Maryland USA	Community statistical areas (N=55)	T-test comparing median tobacco retailer density	Neighborhood Health Profiles (2011); American Community Survey (2005-2009) Median household income (dichotomized at 50th percentile into Low Income [n=28] vs. High Income [n=27])	Neighborhood Health Profiles (2011) which used data from the following sources: • Baltimore City Liquor Board • Baltimore City Comptroller • Baltimore Neighborhood Indicators Alliance from the Baltimore City	N not specified. Establishments that sell cigarettes or other tobacco products as defined by Baltimore City Health Department	Count of tobacco retailers per 10,000 residents	ES1: Low income (median: 30.5, 25th percentile: 19.7, 75th percentile 44.9); high income (median: 16.5, 25th percentile: 9.1, 75th percentile 27.2); p=0.01	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6

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						Police Department • Baltimore City Police Department				
Giovenco 2019[18]	Cross-sectional	New York City (New York) USA	Neighborhood Tabulation Areas (N=188)	Linear regression	US Census Bureau's 5-year American Community Survey (2015) Proportion of non-Hispanic black residents (scaled to 10s)	New York City Open Data Portal (July 2017)	N=8,291 All licensed tobacco retailers	Count of tobacco retailers per 1000 residents	ES1: B: -0.03, 95% CI: -0.07, 0.01, p=0.190	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
					Proportion of non-Hispanic white residents (scaled to 10s)				ES2: B: 0.01, 95% CI: -0.02, 0.05, p=0.435	
					Proportion of Hispanic residents (scaled to 10s)				ES3: B: 0.02, 95% CI: -0.03, 0.07, p=0.468	
					Proportion of non-Hispanic Asian residents (scaled to 10s)				ES4: B: -0.008, 95% CI: -0.02, 0.07, p=0.827	
					Proportion of residents with no health insurance (scaled to 10s)				ES5: B: 0.02, 95% CI: -0.18, 0.22, p=0.808	
					Median household income (scaled to $10,000; calculated as				ES6: B: 0.06, 95% CI: 0.02, 0.10, p=0.007	

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					the average median household income of all census tracts in the Neighborhood Tabulation Area)					
					Proportion of the population 25 years and older with less than a high school education				ES7: B: -0.02, 95% CI: -0.13, 0.08, p=0.634	
Hyland 2003[19]	Cross-sectional	Erie County (New York) USA	Census tracts (N=227)	Analysis of Variance (ANOVA)	Census (1990) Median household income (quartiles)	Erie County Department of Health (1996)	N=1,019 All licensed tobacco retailers	Count of tobacco retailers per 10 km of roadway	ES1: Q1: <19,850 (μ: 4.0) Q2: <27,736 (μ: 3.1) Q3: <35,386 (μ: 1.7) Q4: >/=35,386 (μ: 1.2) p<0.05	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
					Percentage of African American residents (quartiles)			Count of tobacco retailers per 10 km of roadway	ES2: Q1: >6.1 (μ: 4.2) Q2: >0.8 (μ: 2.3) Q3: >0.3 (μ: 1.6) Q4: </=0.3 (μ: 2.0) p<0.05	
Jenkins 2022[20]	*Cross-sectional*	*Ohio* *USA*	*Census tract (N=2,951)*	*2x2 chi^2 analyses*	*American Community Survey 5-year Estimates (2016)* • *'High' vs. 'Low' racial and ethnic minority (Non-Hispanic Black residents and Hispanic residents, 15% cut-off)*	*Active licensed cigarette retailers: all 88 of Ohio's county auditor offices (fall of 2017)* *Hookah cafes and vape shops:*	*N=11,065* *Tobacco retailers* *N=327* *Vape/hookah stores*	*Prevalence of 8 tobacco retailer type: convenience store, discount store, grocery store or mass merchandiser, pharmacy, bar or restaurant, tobacco shop, alcohol store,*	*No unadjusted effect sizes reported: Results are presented by stratifications of high vs. low minority, poverty, and urbanicity.* *"Convenience stores and discount stores selling tobacco were more common (whereas*	*2: Yes* *11: Yes* *13: No* *18: Yes* *20: Yes* *NA1: Yes*

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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					• *'High' vs. 'Low' prevalence of poverty (15.4% cut-off)*	*Internet directories (e.g., Yelp, Yellowpages.com)*	*Note: The authors state that a small percentage of retailers were excluded from analyses but do not specify number*	*vape or hookah shop, other*	*grocery stores and pharmacies were less common) in historically disadvantaged US Census tracts, based on poverty, racial and ethnic composition, or urban and rural status." (p.1)*	*NA2: Yes* *Total: 6*
King 2020[21]	*Cross-sectional*	*Virginia and North Carolina* *USA*	*Census tract (N=not specified)*	*Linear regression models with spatial autocorrelation*	*5-year American Community Survey (2017)* • *Percentage of people who were Black* • *Percentage of people who were Hispanic* • *Percentage of people who had a bachelor degree or higher (college-educational)* • *Percentage of people college-enrolled* • *Percentage of people living below the poverty line*	*NAICS Association (January 2018)*	*Traditional tobacco retailers identified by NAICS code: supermarkets/grocery stores; convenience stores; tobacco stores; gasoline with convenience; warehouse clubs/supercenters; newsstands; beer, wine, liquor stores; pharmacies; discount department stores; other gasoline stations (N=15,084)* *Vape shops: "…defined as places that primarily sold e-cigarettes or other vaping devices." (p. 2396) (N=875)* *Also assessed waterpipe cafes: "…defined as places that sold and served*	*Count of tobacco retailers (each type) per 1,000 people*	*No unadjusted effect sizes reported.* *"Waterpipe cafe, vape shop, and traditional retailer density were higher in communities with more people who were Hispanic, college-educated, and college-enrolled (each p < .05). Waterpipe cafe and traditional retailer density were higher in communities with more people living below the poverty level (each p < .05)." p.2395*	*2: Yes* *11: Yes* *13: No* *18: Yes* *20: Yes* *NA1: No* *NA2: Yes* *Total: 5*

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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
							waterpipe tobacco onsite…" (p. 2396) (N=362)			
Kirst 2019[22]	Cross-sectional	Toronto (Ontario) Canada	Census tract (N=87)	Correlation coefficient	Canadian Census (2006) Median after-tax household income	Ontario Ministry of Health and Long-Term Care Tobacco Information System database (2011) Additional ground-truthing in four randomly selected Forward Sortation Areas was conducted: "A data collector visited all vendors (including convenience stores, grocery stores, restaurants/bars, and gas stations) within the area and verified whether the vendor sold cigarettes by asking the clerk at the counter.") p. 2	N not specified Cigarette retailers (convenience stores, grocery stores, restaurants/bars, and gas stations)	Count of tobacco retailers per km^2	ES1: correlation coefficient: -0.27, p<0.0001	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
Kite 2014[23]	*Cross-Sectional*	*New South Wales* *Australia*	*Local government area (N=138)*	*Linear regression (logged outcome variable)*	*Socio-Economic Indexes for Areas (SEIFA): composite socioeconomic disadvantage measure including level of education, employment status and household income*	*State government list (request made for data in 2011 but unclear actual year of licensing data)*	*N=11,640* *All licensed tobacco retailers*	*Count of tobacco retailers per 100,000 people*	*No unadjusted effect sizes reported.* *"Our findings indicate that there is an association between tobacco outlet density and social disadvantage and remoteness, after controlling for smoking*	*2: Yes* *11: Yes* *13: Yes* *18: Yes* *20: Yes* *NA1: Yes* *NA2: Yes*

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
									prevalence, in New South Wales, Australia." p.181	*Total: 6*
Kong 2020[24]	Cross-sectional	USA (contiguous)	Census tracts (N=71,074)	Spatial Durbin Error Model	2010-2014 American Community Survey Percent non-Hispanic Black	ReferenceUSA (2014) based on North American Industry Classification System (NAICS) codes	N not specified Al tobacco retailers	Count of tobacco retailers per 1,000 people	ES1: Total, B: 0.07 (SE: 0.00), p<0.0001 ES2: Direct, B: 0.06 (SE: 0.00), p<0.0001 ES3: Indirect, B: 0.01 (SE: 0.01), p<0.05	2: Yes 11: Yes 13: Yes 18: Yes 20: Yes NA1: No NA2: Yes Total: 6
					Percent non-Hispanic Black			Count of tobacco retailers per square mile	ES4: Total, B: 0.13 (SE: 0.01), p<0.0001 ES5: Direct, B: 0.05 (SE: 0.01), p<0.0001 ES6: Indirect, B: 0.09 (SE: 0.01), p<0.0001	
					Percent Hispanic or Latino ethnicity			Count of tobacco retailers per 1,000 people	ES7: Total, B: -0.02 (SE: 0.00), p<0.0001 ES8: Direct, B: 0.09 (SE: 0.01), p<0.0001 ES9: Indirect, B: -0.11 (SE: 0.01), p<0.0001	
					Percent Hispanic or Latino ethnicity			Count of tobacco retailers per square mile	ES10: Total, B: 0.33 (SE: 0.01), p<0.0001 ES11: Direct, B: 0.24 (SE: 0.01), p<0.0001 ES12: Indirect, B: 0.09 (SE: 0.01), p<0.0001	
					Percent living below 150% of the federal poverty level			Count of tobacco retailers per 1,000 people	ES13: Total, B: 0.18 (SE: 0.00), p<0.0001 ES14: Direct, B: 0.18 (SE: 0.00), p<0.0001	

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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
									ES15: Indirect, B: 0.01 (SE: 0.01), not statistically significant	
					Percent living below 150% of the federal poverty level			Count of tobacco retailers per square mile	ES16: Total, B: 0.40 (SE: 0.01), p<0.0001 ES17: Direct, B: 0.25 (SE: 0.01), p<0.0001 ES18: Indirect, B: 0.15 (SE: 0.01), p<0.0001	
Kong 2021[25]	*Cross-sectional*	*USA*	*Census tracts (N=71,409)*	*Spatial Durbin Error Model*	*2014-2018 American Community Survey* • *Percent of non-Hispanic white residents* • *Percent of non-Hispanic Black or African American residents* • *Percent of Hispanic or Latino ethnicity residents* • *Percent of residents living below 150% of the federal poverty level* • *Median household income* • *Gini Index of income inequality*	*ReferenceUSA (2018) based on North American Industry Classification System (NAICS) codes*	*N not specified* *All tobacco retailers*	*Count of tobacco retailers per square mile*	*No unadjusted effect sizes reported.* *"A 10-percentage point increase in the Black population was associated with 0.07 (p < 0.05) more retailers per square mile within a focal tract and 0.35 (p < 0.001) more retailers per square mile in its neighbors on average. A greater percent of Hispanic/Latino residents was associated with more retailers per square mile, both within a focal tract (b = 0.95, p < 0.001) and in its neighbors 0.39 (p < 0.001). Inverse associations were observed for percent white. We also observed inequities by socioeconomic status." (p.1)*	*2: Yes* *11: Yes* *13: Yes* *18: Yes* *20: Yes* *NA1: No* *NA2: Yes* *Total: 6*
Kong 2022[26] ***Kong 2020***[24]	Cross-sectional	USA	Census tracts (N=71,495)	Linear regression	2014-2018 American Community Survey Percentage of non-Hispanic Black or African American	ReferenceUSA (2018) based on North American Industry Classification System (NAICS) codes	N=325,884 Al tobacco retailers	Count of tobacco retailers	ES1: B: 0.03 (SE: 0.01), p<0.001 All results are also reported stratified by urbanicity. *An earlier dissertation (*Kong 2020, #8690*) used similar*	2: Yes 11: Yes 13: Yes 18: Yes 20: Yes

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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					population (scaled to 10s)				*methods to examine similar relationships with data from 2014 in the contiguous USA, finding overall a similar pattern of results in terms direction and significance except for a null result (B=0.00, not statistically significant) for % Hispanic or Latino (retailers per 1000 people).*	NA1: No NA2: Yes Total: 6
				Linear regression	Percentage of non-Hispanic Black or African American population (scaled to 10s)			Count of tobacco retailers per 1,000 people	ES2: B: 0.04 (SE: 0.00), p<0.001	
				Linear regression	Percentage of non-Hispanic Black or African American population (scaled to 10s)			Count of tobacco retailers per square mile	ES3: B: 0.51 (SE: 0.02), p<0.001	
				Linear regression	Percentage of non-Hispanic Black or African American population (scaled to 10s)			Count of tobacco retailers per 10 kilometers of roadway	ES4: B: 0.10 (SE: 0.00), p<0.001	
				Logistic regression	Percentage of non-Hispanic Black or African American population (scaled to 10s)			Presence (vs. absence) of at least one tobacco-selling pharmacy	ES17: OR: 0.97, 95% CI: 0.96-0.98	
				Logistic regression	Percentage of non-Hispanic Black or African American population (scaled to 10s)			Presence (vs. absence) of at least one tobacco shop	ES18: OR: 0.93, 95% CI: 0.92-0.94	

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
				Linear regression	Percentage of Hispanic or Latino population (scaled to 10s)			Count of tobacco retailers	ES5: B: 0.06 (SE: 0.01), p<0.001	
				Linear regression	Percentage of Hispanic or Latino population (scaled to 10s)			Count of tobacco retailers per 1,000 people	ES6: B: -0.01 (SE: 0.00), p<0.001	
				Linear regression	Percentage of Hispanic or Latino population (scaled to 10s)			Count of tobacco retailers per square mile	ES7: B: 1.28 (SE: 0.02), p<0.001	
				Linear regression	Percentage of Hispanic or Latino population (scaled to 10s)			Count of tobacco retailers per 10 kilometers of roadway	ES8: B: 0.25 (SE: 0.00), p<0.001	
				Logistic regression	Percentage of Hispanic or Latino population (scaled to 10s)			Presence (vs. absence) of at least one tobacco-selling pharmacy	ES19: OR: 0.98, 95% CI: 0.97-0.99	
				Logistic regression	Percentage of Hispanic or Latino population (scaled to 10s)			Presence (vs. absence) of at least one tobacco shop	ES20: OR: 1.03, 95% CI: 1.02-1.04	
				Linear regression	Percentage of population living below 150% of the federal poverty level (scaled to 10s)			Count of tobacco retailers	ES9: B: 0.40 (SE: 0.01), p<0.001	
				Linear regression	Percentage of population living below 150% of the federal poverty level (scaled to 10s)			Count of tobacco retailers per 1,000 people	ES10: B: 0.16 (SE: 0.00), p<0.001	
				Linear regression	Percentage of population living below 150% of the federal poverty level (scaled to 10s)			Count of tobacco retailers per square mile	ES11: B: 1.41 (SE: 0.03), p<0.001	

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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				Linear regression	Percentage of population living below 150% of the federal poverty level (scaled to 10s)			Count of tobacco retailers per 10 kilometers of roadway	ES12: B: 0.27 (SE: 0.00), p<0.001	
				Logistic regression	Percentage of population living below 150% of the federal poverty level (scaled to 10s)			Presence (vs. absence) of at least one tobacco-selling pharmacy	ES21: OR: 0.96, 95% CI: 0.95-0.97	
				Logistic regression	Percentage of population living below 150% of the federal poverty level (scaled to 10s)			Presence (vs. absence) of at least one tobacco shop	ES22: OR: 1.06, 95% CI: 1.05-1.07	
				Linear regression	Percentage of vacant housing units (scaled to 10s)			Count of tobacco retailers	ES13: B: 0.23 (SE: 0.01), p<0.001	
				Linear regression	Percentage of vacant housing units (scaled to 10s)			Count of tobacco retailers per 1,000 people	ES14: B: 0.24 (SE: 0.00), p<0.001	
				Linear regression	Percentage of vacant housing units (scaled to 10s)			Count of tobacco retailers per square mile	ES15: B: -0.51 (SE: 0.04), p<0.001	
				Linear regression	Percentage of vacant housing units (scaled to 10s)			Count of tobacco retailers per 10 kilometers of roadway	ES16: B: -0.14 (SE: 0.01), p<0.001	
				Logistic regression	Percentage of vacant housing units (scaled to 10s)			Presence (vs. absence) of at least one tobacco-selling pharmacy	ES23: OR: 0.82, 95% CI: 0.81-0.84	
				Logistic regression	Percentage of vacant housing units (scaled to 10s)			Presence (vs. absence) of at least one tobacco shop	ES24: OR: 0.88, 95% CI: 0.86-0.90	
Laws 2002[27]	Repeated cross-section	Boston (Massachusetts)	Business district (n=10);	Spearman correlation	Did not specify data source (1989):	Store audits/visits; did not specify how stores were located:	South Lawrence (N=80)	Percentage of stores selling tobacco products	ES1: Year 1 and Year 2 correlation between per capita income in a district and the	2: Yes 11: No

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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		USA	"first selected the largest Latino enclave in Boston … and … the largest predominantly Latino community in Massachusetts. We identified census tracts of similar economic status but differing ethnic composition, then selected at random a predominantly African American district... For contrast, we purposefully selected Newbury Street in Boston's Back Bay, an affluent neighborhood." p. ii71		Per capita income	"All private businesses open to the public were observed and included in the database." p. ii72 Stores were visited twice: 1998 (Year 1); 1999 (Year 2) Note: some stores in two business districts were not revisited both years.	Newbury Street (N=406)		percentage of establishments selling tobacco (ρ: -0.794, p=0.006) ES2: Year 1 correlation between per capita income in a district and the percentage of establishments selling tobacco (ρ: -0.9, p=0.037) ES3: Year 2 correlation between per capita income in a district and the percentage of establishments selling tobacco (ρ: -0.7, p=0.036)	13: No 18: Yes 20: Yes NA1: No NA2: Yes Total: 4
Lee 2016[28]	Cross-sectional	97 counties (for nationally representati	Census tract (N=17,667)	Spatial error regression	US Census (2010)	Reference USA (2012)	N=not reported Supermarkets and other grocery (except	Count of tobacco retailers per 1000 people	ES1: Female Couples: Estimate: 0.01, SE: <0.01, p<0.001	2: Yes 11: Yes 13: Yes

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		ve sample of US tobacco retailers) USA			Same-sex coupled households per 1000 coupled households	North American Industry Classification System (NAICS) Association (2012)	convenience) stores, convenience stores, tobacco stores, gasoline stations with convenience stores, warehouse clubs and supercenters, news dealers and newsstands, beer, wine, and liquor stores (except state-controlled liquor stores), pharmacies and drug stores (top 50 chains), discount department stores (Walmart only), other gasoline stations.		ES3: Sensitivity tests excluding edge tracts from counties (n=15,085): Estimate: -0.05, p<0.01 ES2: Male Couples: Estimate: 0.01, SE: <0.01, p<0.001 ES4: Sensitivity tests excluding edge tracts from counties (n=15,085): Estimate: 0.01, p=not specified, "estimates were similar" p. 151 Also reports adjusted effect sizes.	18: Yes 20: Yes NA1: No NA2: Yes Total: 6
Lee 2017[29]	Cross-sectional	97 counties (for nationally representative sample of contiguous US tobacco retailers) USA	Census tract (N=17,667)	Spatial error regression	Census (2010) Proportion identifying as black/African-American (alone or in combination with other races) (scaled to 10s)	Reference USA (2012) North American Industry Classification System (NAICS) Association (2012)	N=89,804 Supermarkets and grocery stores, convenience stores, tobacco shops, gasoline stations with convenience stores, warehouse clubs and supercenters, news dealers and newsstands, alcohol stores (except state-owned liquor stores), pharmacies (top 50 chains only), discount department stores	Count of tobacco retailers per 1000 people	ES3: Coefficient: 0.05, 95% CI: 0.04, 0.07	2: Yes 11: Yes 13: Yes 18: Yes 20: Yes NA1: No NA2: Yes Total: 6

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							(Walmart only), other gasoline stations.			
					Proportion identifying as Asian/Pacific Islander (alone or in combination with other races) (scaled to 10s)			Count of tobacco retailers per 1000 people	ES2: Coefficient: -0.04, 95% CI: -0.06, -0.01	
					Proportion identifying as Hispanic or Latino ethnicity (scaled to 10s)			Count of tobacco retailers per 1000 people	ES4: Coefficient: 0.01, 95% CI: -0.01, 0.02	
					Proportion identifying as white race alone (scaled to 10s)			Count of tobacco retailers per 1000 people	ES5: Coefficient: -0.04, 95% CI: -0.05, -0.03	
					American Community Survey 5-year estimates (2008-2012) Median household income in 2012 dollars, standardized within each county and scaled to 10s			Count of tobacco retailers per 1000 people	ES1: Coefficient: -0.24, 95% CI: -0.27, -0.22	
					Percentage of housing units that are renter occupied (scaled to 10s)			Count of tobacco retailers per 1000 people	ES7: Coefficient: 0.15, 95% CI: 0.14, 0.16	
					Percentage of housing units that are vacant (scaled to 10s)			Count of tobacco retailers per 1000 people	ES6: Coefficient: 0.35, 95% CI: -0.32, 0.38	
Loomis 2013[30]	*Cross-sectional*	*New York (stratified analyses for New York State; Greater New York City/Long Island*	*Census tract (total = 4,795; differs by location)*	*Spatial lag regression* *Ordinary Least Square (OLS) regression (Monroe County)*	*Data source and year not specified.* • *Percentage of African Americans* • *Percentage of Hispanics*	*Data source not specified but states "New York State requires retailers who wish to sell tobacco to obtain a licence from the New York State Department of Tax*	*N=19,420* *All licensed tobacco retailers*	*Count of tobacco retailers per 10 kilometers of roadway*	*No unadjusted effect sizes reported.* *"In New York State, residential census tracts with higher proportions of African Americans and Hispanics generally had a significantly higher density of tobacco*	*2: Yes* *11: Yes* *13: No* *18: Yes* *20: Yes* *NA1: Yes*

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		[Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester Counties]; New York minus Greater New York City/Long Island [rest of State]; Capital region [Albany, Rensselaer, Saratoga, Schenectady Counties]; Erie County [Buffalo]; Monroe County [Rochester] ; Onondaga County [Syracuse]) *USA*			• *Median household income*	*and Finance" p. 334 (2009)*			*retailers. Census tracts with a higher percentage of residents aged <18 years and higher median household income generally had a significantly lower density of tobacco retailers. However, these associations were not statistically significant in all areas studied." P.333*	*NA2: Yes* *Total: 6*
Maras hi-	*Cross-sectional*	*New South Wales*	*Census collection*	*Generalized ordered logistic regression*	*Australian Census (2006): residential population data for*	*New South Wales (NSW) Ministry of Health online*	*N=12,422*	*Adaptive bandwidth kernel density estimation (maximum*	*No unadjusted effect sizes reported.*	*2: Yes* *11: Yes*

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Pour 2015[31]		*Australia*	*districts (N=11,811)*		*estimating population density to be used for retailer density calculation. "Each property was given a weight based on the estimated number of people living in each household in each census collection district." (p. 2)* *NSW Index of Relative Socioeconomic Disadvantage (IRSD) calculated for the NSW 2006 Census population: "This index uses 20 disadvantage indicator variables including income, education, employment and the proportion of Aboriginal people to assign a relative socioeconomic status to geographic areas" (p. 2) (categorized into population-weighted quintiles "where the first quintile indicates least disadvantage and the fifth quintile most disadvantage") (p. 2)*	*registration system ("…all tobacco retailers have been required to notify NSW Ministry of Health…") (2009-2011) (p. 2)* *All registered tobacco retailers (e.g., tobacconists, supermarkets, newsagents, petrol stations, convenience stores, liquor licensed premises)*	*All registered tobacco retailers*	*bandwidth: 1000 people or 25 kilometers in "sparsely populated areas" (p. 2)): count of tobacco retailers per 1,000 population (average "categorized into four approximately equal-sized ordered categories": zero, low, medium, high) (p. 2)*	*"More disadvantaged Census Collection Districts (CDs) were significantly more likely to have higher tobacco outlet densities." P.1*	*13: Yes* *18: Yes* *20: Yes* *NA1: Yes* *NA2: Yes* *Total: 7*
Marsh 2013[32]	Cross-sectional	New Zealand	Meshblock (N=not specified)	Linear regression	NZDep2006 index (2006): "combines nine variables from the 2006	Compiled through contacts with Smokefree	N=5,008	Count of tobacco retailers	ES1: Coefficient: 72.4, SE: 10.01, 95% CI: 49.32-95.48, p<0.05	2: Yes 11: Yes

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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					census that reflect eight dimensions of deprivation, including income, education, qualifications, employment, housing, access to a car and telephone" (p. 166) where 1=least deprived score and 10=most deprived score	Enforcement Officers at each District Health Board as no available register: "The local lists compiled by SEOs represented the most accurate source of data on tobacco retailers…these included visits to retailers, local knowledge, and the use of directories such as Yellow Pages, internet directors, and local newspapers." p. 166 (2017)	All known tobacco retailers			13: Yes 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 7
Marsh 2020[33]	Cross-sectional	New Zealand	Meshblock (N=not specified)	Linear regression	Census (2013): count of residents aged 15 years and above (used for density calculation) NZDep2013 index (2013): "…combines nine variables from the 2013 census that reflect eight dimensions of deprivation…" where 1=areas with the least deprived score and 10=areas with the most deprived score (p. 35)	"We developed a national database of tobacco retailers in 2012. This was updated in 2017 using the same methods. The tobacco retailer database includes convenience stores, petrol stations, supermarkets, and liquor stores; pharmacies do not currently sell	N=5,243 Convenience stores, petrol stations, liquor stores, supermarkets, other	Count of tobacco retailers	ES1: Coefficient: 87.81, SE: 9.22; 95% CI: 66.56-109.07	2: Yes 11: Yes 13: Yes 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 7

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						tobacco in New Zealand." P.35 Additionally, petrol station audited using online lists; off-licence liquor stores obtained from New Zealand Liquor Licensing Authority and audited by phone to verify they sold tobacco. Duplicate listings and missing/incomplete addresses were removed/resolved through online searching and Google Street View.				
								Count of liquor stores	ES2: Coefficient: 14.17, SE: 1.60; 95% CI: 10.48-17.86	
								Count of petrol stations	ES3: Coefficient: 15.17, SE: 2.75; 95% CI: 8.82-21.52	
Mayers 2012[34]	Cross-sectional	Polk County (Iowa) USA	Census tract (N=80)	Analysis of Variance (ANOVA)	Census (2000) Percent African American (quartiles)	State of Iowa licensing (2003)	N=482 All licensed tobacco retailers	Count of tobacco retailers per 10 km roadway	ES1: df=3; F=1.82, η2=0.08, p=0.16 (did not report means across quartiles) Also reports adjusted effect sizes.	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes

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										NA2: Yes Total: 6
					Percent Hispanic (quartiles)			Count of tobacco retailers per 10km roadway	ES2: df=3; F=0.04, η2=0.00, p=0.99 (did not report means across quartiles) Also reports adjusted effect sizes.	
					Median household income (quartiles)			Count of tobacco retailers per 10km roadway	ES3: df=3; F=1.30, η2=0.05, p=0.28 (did not report means across quartiles) Also reports adjusted effect sizes and interactions between quartiles of sociodemographic variables.	
								Count of tobacco outlets per 1000 population	No unadjusted effect sizes reported.	
								Count of tobacco retailers per square mile	No unadjusted effect sizes reported.	
Melody 2018[35]	Cross-sectional	Tasmania Australia	Statistical Area Level 2 (SA2)	Poisson regression	Australian Bureau of Statistics (ABS) Index of Relative Socioeconomic Advantage and Disadvantage (IRSAD) (2011): composite score where lower values indicate greater socioeconomic disadvantage (quartiles) ABS Census of Population and Housing (2011): used total population counts for	Tobacco Seller's License database maintained by the Tasmania Department of Health and Human Services (December 2016)	N=769 All licensed tobacco retailers	Count of tobacco retailers per 1000 residents	IRSAD quartiles (Q) where Very High (least deprived) = reference Tasmania (94 SA2s) ES1: High (Rate Ratio: 1.60, 95% CI: 0.89, 3.00, p=0.13) ES2: Low (Rate Ratio: 2.24, 95% CI: 1.30, 4.09, p=0.011) ES3: Very Low (most deprived) (Rate Ratio: 2.30, 95% CI: 1.32, 4.21, p=0.014) Great Hobart region (33 SA2s) ES4: High (Rate Ratio: 0.89, 95% CI: 0.30, 2.45, p=1.0)	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6

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					outcome variable calculation				ES5: Low (Rate Ratio: 1.19, 95% CI: 0.47, 3.00, p=1.0) ES6: Very Low (most deprived) (Rate Ratio: 1.57, 95% CI: 0.69, 3.75, p=0.88) Tasmania, excluding Great Hobart (61 SA2s) ES7: High (Rate Ratio: 1.29, 95% CI: 0.66, 2.60, p=0.46) ES8: Low (Rate Ratio: 2.31, 95% CI: 1.29, 4.44, p=0.017) ES9: Very Low (most deprived) (Rate Ratio: 2.01, 95% CI: 1.10, 3.88, p=0.029)	
Mills 2022[36]	*Repeated cross-sectional*	*USA*	*Census tract (N not reported)*	*Log-linear regression*	*2000 US Decennial Census; 2005-2009/2010-2014/2015-2019 American Community Surveys* • *Percent of the population that is non-Hispanic Black or African American* • *Percent of the population that is Hispanic or Latino ethnicity* • *Median household income (adjusted for inflation)* • *Percent of housing rental units that are vacant*	*NETS Database (2000-2017) using North American Industry Classification System (NAICS) codes "…for which the majority (>/=50%) were tobacco retailers and who sales accounted for at least 2% of all retail tobacco sales as tobacco retailers […] along with stores whose name included the words "tobacco," "cigarette" or*	*N not specified.* *All tobacco retailers*	*Count of tobacco retailers per 1,000 people*	*No unadjusted effect sizes reported.* *"There were significant, positive relationships between tobacco retailer density and the percentage of Black (standardized exp(b) = 1.05 [95% CI: 1.04% to 1.07%]) and Hispanic (standardized exp(b) = 1.06 [95% CI: 1.05% to 1.08%]) residents and the percentage of vacant housing units (standardized exp(b) =1.08 [95% CI: 1.07% to 1.10%]) in a census tract. Retailer density was negatively associated with income (standardized exp(b) = 0.84 [95% CI: 0.82% to 0.86%]). From 2000 to 2017, the relationship between retailer*	*2: Yes* *11: Yes* *13: Yes* *18: Yes* *20: Yes* *NA1: No* *NA2: Yes* *Total: 6*

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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						"vape"/"vapor"/"vaping."" (p.1292)			*density and income and vacant housing units became weaker." (p.1291)*	
Novak 2006[37]	Cross-sectional	Chicago (Illinois) USA	Census tract (n=178) Sample of census tracts for larger individual-level study.	Bivariate Correlations	Census (1990) Percentage White	Ground-truthed (year not specified): "Trained raters drove at 5mph down every street within the selected census tracts. Each side of the block was videotaped…Additional codes were created to identify any retail locations that were licensed to sell tobacco, specifically liquor stores, gas stations, convenience stores, supermarkets, and bars." p. 671	N not specified. Liquor stores, gas stations, convenience stores, supermarkets, and bars	Count of block faces with at least 1 retail outlet divided by the total number of observed block faces per census tract	ES1: r: -0.16, p=0.027	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: No NA2: Yes Total: 5
					Percentage Black				ES2: r: -0.17, p=0.020	
					Percentage Hispanic				ES3: r: 0.37, p=0.001	
					Percentage Poverty				ES4: r: 0.22, p=0.003	
					Percentage aged >25 y with associates degree or higher				ES5: r: -0.22, p=0.002	
					Percentage aged >16 y unemployed				ES6: r: 0.02, p=0.793	
					Percentage foreign born				ES7: r: 0.38, p=0.001	
					Percentage families with income <$17,500				ES8: r: 0.29, p=0.001	

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					Percentage families with income >/=$17,500 and </= $60,000				ES9: r: 0.09, p=0.192	
					Percentage families with income >$60,000				ES10: r: -0.29, p=0.001	
					Percentage persons in owner-occupied housing				ES11: r: -0.35, p=0.001	
					Percentage households on public assistance				ES12: r: 0.07, p=0.315	
Ogneva-Himmelberger 2010[38]	Cross-sectional	Worcester (Massachusetts) USA	Census block group (N=167)	Kruskal-Wallis test comparing average tobacco retailer density	MassGIS (year not specified): Tertiles of percentage minority population (defined as "non-Caucasian population") p. 476	Worcester Health Department and License Commission (year not specified)	N=289 All licensed tobacco retailers	Count of tobacco retailers per 1,000 people	E1: $\chi 2 = 11.13$, p=0.004 Q1 (0-12%): 1.15 Q2 (12-30%): 2.08 Q3 (30-89%): 2.62 Also reports adjusted effect sizes.	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
				Kruskal-Wallis test comparing average tobacco retailer density	Tertiles of household income level "based on state definitions" of low (<$25,000/year); medium ($25,000-75,000/year); high (>$75,000/year) (p. 476)			Count of tobacco retailers per 1,000 people	E2: $\chi 2 = 8.929$, p=0.012 Q1 (Below $25,000): 3.03 Q2 ($25,000-75,000): 1.79 Q3 (>/=$75,000): 0 Also reports adjusted effect sizes.	
Paul 2010[39]	Cross-sectional	Hunter Region (New South Wales) Australia	Census collection districts (N=1,161) Postcode areas (N=73)	Pearson correlation coefficient	Socio-economic Index for Areas (SEIFA) in quartiles	Hunter & New England Area Health Service (HNEAHS) (year not specified): 1) database used for monitoring tobacco sales to minors; 2) licensed premises	N=1,270 All licensed tobacco retailers	Count of tobacco retailers	ES1: r: -0.140 (no p-value specified but authors state, "no significant relationship was found" p. 802) ES2: r: 0.192 (no p-value specified but authors state, "no significant relationship was found" p. 802)	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes

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						"Such data sources represent the most accurate approximation of product availability" (p. 800) though authors acknowledge databases are updated every 2-3 years and there may be an underestimate of actual number of tobacco retailers				NA2: Yes Total: 6
Peterson 2011[40]	Cross-sectional	New Jersey USA	Census tract (N=1,938)	Analysis of Variance (ANOVA) comparing average tobacco retailer density Also reports ANOVA results of quartiles of demographic variables (i.e., median household income, percent African-American, and Percent Hispanic) and tobacco retailer density within three 'disparity clusters'	Census (2000) Median household income	New Jersey Department of the Treasury (2004)	N=13,984 All licensed tobacco retailers	Count of tobacco retail outlets per 10km of roadway	ES1: F(3,1933)=245.92, p<0.05 Q1 (<$40,469): 13.1 Q2 (</=$53,219): 4.8 Q3 (</=$70,888): 2.3 Q4 (</=$201,000): 1.5	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6

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				Analysis of Variance (ANOVA) comparing average tobacco retailer density	Percent of African-American residents (quartiles)			Count of tobacco retail outlets per 10km of roadway	ES2: F(3,1922)=26.52, p<0.05 Q1 (<01): 3.6 Q2 (</=04): 4.1 Q3 (</=15): 5.6 Q4 (</=98): 8.2	
				Analysis of Variance (ANOVA) comparing average tobacco retailer density	Percent of Hispanic residents (quartiles)			Count of tobacco retail outlets per 10km of roadway	ES3: F(3,1931)=280.85, p<0.05 Q1 (<03): 1.4 Q2 (</=06): 2.1 Q3 (</=15): 4.5 Q4 (</=93): 13.5	
Purushothaman 2022[41]	*Longitudinal*	*California* *USA*	*County (N not specified)*	*Mixed-effects linear regression model*	*2015-2019 American Community Survey* • *White population* • *African American population* • *Asian population* • *American Indian/Alaska Native population* • *Hispanic population* • *Native Hawaiian/Pacific Islander population* • *Median household income*	*California Department of Tax and Fee Administration (January 2015-December 2019)* *Yelp: "In June 202, store categories listed on Yelp were data mined, based on store names and addresses obtained from CDTFA retail license data…" p.3*	*N = 26,371* *"Licenses that were cross-referenced and matched for store categorization using Yelp…" p.3*	*Count of active tobacco retailer licenses, and broken down by "specialized" vs. "non-specialized" (p. 1) stores and tobacco/vape store types*	*No unadjusted effect sizes reported.* *"Regional volume of retailers was positively associated with higher proportion of women, lower median household income, and higher proportion of Hispanic residents." P.1*	*2: Yes* *11: Yes* *13: No* *18: Yes* *20: Yes* *NA1: Yes* *NA2: Yes* *Total: 6*
Raskind 2022[42]	Cross-sectional	California USA	Census tract (N=6,716)	Logistic regression	2013-2017 American Community Survey Percent non-Hispanic African American (standardized)	California Department of Tax and Fee Administration (CDTFA) (2018)	N=7,678 All licensed tobacco retailers	Presence (vs. absence) of at least one dollar store	ES1: OR: 1.16, 95% CI: 1.08-1.25	2: Yes 11: No 13: No 18: Yes 20: Yes

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										NA1: Yes NA2: Yes Total: 5
					Percent Hispanic (any race) (standardized)			Presence (vs. absence) of at least one dollar store	ES2: OR: 1.57, 95% CI: 1.4-1.76	
					Percent non-Hispanic Asian/Pacific Islander			Presence (vs. absence) of at least one dollar store	ES3: OR: 0.42, 95% CI: 0.34-0.52	
					Percent non-Hispanic multiple races/American Indian and Alaska Native (standardized)			Presence (vs. absence) of at least one dollar store	ES4: OR: 0.97, 95% CI: 0.84-1.12	
					Median household income (standardized)			Presence (vs. absence) of at least one dollar store	ES5: OR: 0.23, 95% CI: 0.2-0.28	
Reid 2013[43]	Cross-sectional	New Jersey USA	Census tract (N=1,935)	Hierarchical regression	United States Census (2000) Percentage of Hispanic residents	New Jersey Department of Treasury (2004)	N=13,805 All licensed tobacco retailers	Count of tobacco retailers per 10 kilometers of roadway (logarithmic transformation)	ES1: b: 0.601, B: 0.616, SE: 0.018, p<0.001 ES2: R^2: 0.38	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
					Median household income of Hispanic residents (stratified variable)			Count of tobacco retailers per 10 kilometers of roadway (logarithmic transformation)	Stratified analyses of percentage of Hispanic residents by low vs. high median income tracts: ES3: Low median income tracts: r=0.57, p<0.01 ES4: High median income tracts: r=0.34, p<0.001	

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Rodriguez 2013[44]	*Cross-sectional*	*USA (contiguous)*	*Census tract (N=64,909)*	*Multiple regression*	*U.S. Census (2000)* *Log transformed and mean centered:* • *Proportion of black race* • *Proportion of Hispanic ethnicity* • *Proportion of families with income below the poverty level* • *Proportion of women older than 25 years without a high school diploma or equivalent* • *Average household size*	*Office of Management and Budget North American Industry Classification System (NAICS) codes (2007)*	*N=306,695* *"…all likely points of sale for tobacco products, including establishments coded as tobacco stores, grocery stores, gas stations and convenience stores" p.350*	*Adaptive bandwidth kernel density estimation (influence limited to 1,000 people; 25-km radius in sparsely populated areas): average count of tobacco retailers per 1,000 population (log transformed)*	*No unadjusted effect sizes reported.* *"Furthermore, higher TOD was associated with larger proportions of blacks, Hispanics, women with low levels of education and with smaller household size. Urban-rural differences in the relation between demographics and TOD were found in all sociodemographic categories, with the exception of poverty, but were particularly striking for Hispanics, for whom the relation with TOD was 10 times larger in urban compared with rural census tracts." P.349*	*2: Yes* *11: Yes* *13: Yes* *18: Yes* *20: Yes* *NA1: No* *NA2: Yes* *Total: 6*
Rodriguez 2014[45]	*Cross-sectional*	*USA (contiguous)*	*Census tract (N=64,909)*	*Latent variable mixture modeling*	*U.S. Census (2000)* • *Proportion of Blacks* • *Proportion of Hispanics* • *Families with income below the poverty level*	*Office of Management and Budget North American Industry Classification System (NAICS) codes (2007)*	*N=306,695* *NAICS codes specified: Beer, wine, and liquor stores, Convenience stores, Drinking places (alcoholic beverages), Other gasoline stations, Supermarkets and other grocery (except convenience) stores* *"…all likely points of sale for tobacco products in 2007,*	*Adaptive bandwidth kernel density estimation (influence limited to 1,000 people; 25-km radius in sparsely populated areas): average count of tobacco retailers per 1,000 population (log transformed)*	*No unadjusted effect sizes reported.* *"We identified six disparity classes. There was considerable heterogeneity in relation to TOD for Hispanics in rural settings. For Blacks, there was no relation to TOD in an urban moderate disparity class, and for rural census tracts, the relation was highest in a moderate disparity class." P.155*	*2: Yes* *11: Yes* *13: Yes* *18: Yes* *20: Yes* *NA1: No* *NA2: Yes* *Total: 6*

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							including establishments coded as tobacco stores, grocery stores, gas stations, and convenience stores…" p. 156			
Schneider 2005[46]	Cross-sectional	Polk County (Iowa) USA	Census tract (N=80)	Analysis of Variance (ANOVA) comparing tobacco retailer density	Census (2000) Median household income (quartiles)	Tobacco Enforcement Section of Iowa's Alcoholic Beverages Division (2003)	N=474 All licensed tobacco retailers	Count of tobacco retailers per 10km of roadway	ES1: F=4.56, p</=0.05 Q1 (<$35,106): 1.6 Q2 (<$44,853): 1.5 Q3 (<$55,999): 0.8 Q4 (>/=$55,999): 0.8	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
					Percent African American (quartiles)				ES2: F=3.46, p</=0.05 Q1 (>5.4): 1.5 Q2 (>2.4): 1.3 Q3 (>1.1): 1.2 Q4 (</=1.1): 0.6	
					Percent Latino (quartiles)				ES3: F=3.45, p</=0.05 Q1 (>6.6): 1.5 Q2 (>3.0): 1.4 Q3 (>1.5): 1.1 Q4 (</=1.5): 0.7	
Schneider 2013[47]	Cross-sectional	Cologne Germany	Social areas (n=18 in four districts of Cologne)	Kendall's τ_β correlation	Data source and year unclear Percentage of parents with a joint annual taxable income of <	Ground-truthed tobacco retailers (December 2009): "As the locations of the outlets of interest are not	N=339 Supermarkets, shops, kiosks, gas stations, catering venues (e.g., restaurants, bars),	Count of tobacco retailers	ES1: τ_β: 0.433, p=0.012	2: Yes 11: No 13: No 18: Yes

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					€12,272 (year not specified)	officially registered, all streets and squares within the defined study area were covered during usual opening hours on foot or by bicycle." (p. 1169)	service stations, drugstore chains, owner-managed shops and kiosks, cigarette vending machines, including those in service establishments (e.g., bars, pubs, or restaurants)			20: Yes NA1: Yes NA2: Yes Total: 5
					Data source and year unclear Whether district percentage of low-income parents was greater or less than 32% (year not specified)				ES2: τ_β: -2.22, p=0.041	
					Data source unclear (2007) Youth unemployment rates				ES3: τ_β: 0.322, p=not statistically significant	
					Data source unclear (2007) Proportion of the population receiving social welfare				ES4: τ_β: 0.289, p=not statistically significant	
					Data source unclear (2007) Percentage of pupils attending low-qualifying schools				ES3: τ_β: 0.268, p=not statistically significant	

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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
Schwartz 2021[48]	*Cross-sectional*	*Ohio (13 cities)* *USA*	*Subregions (N=3,846)*	*General estimating equations/negative binomial regression*	*5-year American Community Survey (2016)* • *Percent African American (dichotomized into "High" vs. "Low" prevalence if 15% or more of the population was African American) p. 2* • *Percent Hispanic (dichotomized into "High" vs. "Low" prevalence if 15% or more of the population was Hispanic) p. 2* • *Poverty (dichotomized into "High" vs. "Low" prevalence if 15.4% or more of the population was below the poverty level) p. 2*	*Licensed cigarette retailers: Ohio's 88 county auditor offices (fall of 2017)* *Hookah cafes and vape shops: Internet directories (i.e., Yelp, Yellowpages.com)*	*N=5,548* *(5,379 cigarette licenses and 169 vape/hookah stores)*	*Count of tobacco retailers per 1,000 people*	*No unadjusted effect sizes.* *"Findings indicated that as grades increased from "Best" to "Still Desirable" to "Definitely Declining" and "Hazardous," retailer density increased monotonically." P.1*	*2: Yes* *11: Yes* *13: No* *18: Yes* *20: Yes* *NA1: Yes* *NA2: Yes* *Total: 7*
Shortt 2015[49]	Cross-sectional	Scotland United Kingdom	Data zones (N=6,502)	Analysis of variance (ANOVA) comparing mean (μ) tobacco retailer density	Scottish Index of Multiple Deprivation (2012): income deprivation domain (i.e., the proportion of the population experiencing income deprivation as measured by five indicators, including households included in income deprivation domain; adults and	Scottish Tobacco Retailers Register (September 2012)	N=10,161 All registered retailers selling tobacco products	Tobacco outlets per 10,000 population (Kernel density estimation, which "divides Scotland into 100x100 m grid cells, and assesses the number and proximity of outlets within an 800 m radius for each cell." The authors then calculated	ES1: p<0.001 Q1 (least deprived): μ: 49.6, 95% CI: 44.2-54.9 Q2: μ: 64.3, 95% CI: 56.1-72.5 Q3: μ: 86.1, 95% CI: 79.7-92.6 Q4: μ: 94.6, 95% CI: 89.7-99.5 Q5 (most deprived): μ: 99.9. 95% CI: 95.1-104.7	2: Yes 11: Yes 13: Yes 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 7

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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					children in Income Support households; adults and children in Job Seekers Allowance households; adults in Guarantee Pension Credit households; adults and children in Tax Credit Households on low incomes), quintiles [Q] where 1=least deprived, 5=most deprived			population-weighted outlet density values.) (p.2)		
Siahpush 2010[50]	Cross-sectional	Omaha Metropolitan Area (Nebraska) USA	Census tract (n=94)	Linear regression, Adjusted R^2	Census (2000) Median household income (scaled to $10,000)	City of Omaha, licensed tobacco retailers (October 2008) InfoUSA: denominator of percentage of stores that sold tobacco outcome variable: "the number of all businesses in a neighbourhood that sold a product or provided a service to the public, including retail stores, travel agencies and dentists" p. 526 (February 2009)	N not specified All licensed tobacco retailers	Percentage of stores that sold tobacco (natural log transformation)	ES1: Coefficient: -0.012, p<0.001	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
					Median household income (scaled to $10,000)			Count of tobacco retailers per square	ES4: Coefficient: -0.018, p<0.001	

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								miles (natural log transformation)		
					Percentage African American population (scaled to 10s)			Percentage of stores that sold tobacco (natural log transformation)	ES2: Coefficient: 0.011, p<0.001	
					Percentage African American population (scaled to 10s)			Count of tobacco retailers per square miles (natural log transformation)	ES5: Coefficient: 0.004, p=0.297	
					Percentage Hispanic population (scaled to 10s)			Percentage of stores that sold tobacco (natural log transformation)	ES3: Coefficient: 0.009, p=0.049	
					Percentage Hispanic population (scaled to 10s)			Count of tobacco retailers per square miles (natural log transformation)	ES6: Coefficient: 0.019, p=0.012	
Siegel 2019[51]	Cross-sectional	New Castle County (Delaware) USA	Census tract (N=130)	T-tests	American Community Survey (year not specified) "High poverty": percentage of residents who lived below the poverty line was >/= 75th percentile (p. 2)	Public state business license database (exact source and year not specified)	N not specified All licensed tobacco retailers	Count of tobacco retailers per 1,000 adults	ES1: 3.37 vs. 1.42, p<0.001	
					"Predominant minority": non-white racial or ethnic group constituted the highest proportion of the tract population (p. 2)				ES2: 3.21 vs. 1.56, p<0.001	
					"High poverty and predominant minority"				ES3: 3.45 vs. 1.61, p<0.001	

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					"High poverty": percentage of residents who lived below the poverty line was >/= 75th percentile "Predominant minority": non-white racial or ethnic group constituted the highest proportion of the tract population (p. 2)					
Tucker-Seeley 2016[52]	Cross-sectional	Rhode Island USA	Census tract (N=240)	Ordinary least squares (OLS) regression	U.S. Census (2010); American Community Survey (2007-2011) Median household income (per $10,000 increase)	Cigarette licensing list created and maintained by tax administrator (May 2015)	N=1,334 All licensed cigarette retailers	Count of tobacco retailers per 10km of roadway (log-transformed after adding a constant of 1)	ES1: B: -0.198, 95% CI: -0.222, 0.173; r^2=0.51	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
					Percent of adults with a high school diploma or greater			Count of tobacco retailers per 10km of roadway	ES2: B: -0.038, 95% CI: -0.043, -0.033; r^2=0.49	
					Percent Hispanic residents			Count of tobacco retailers per 10km of roadway	ES3: B: 0.036, 95% CI: 0.029, 0.044; r^2=0.28	
					Percent African American/Black residents			Count of tobacco retailers per 10km of roadway	ES4: B: 0.023, 95% CI: 0.020, 0.027; r^2=0.41	
					Percent of families in poverty			Count of tobacco retailers per 10km of roadway	ES5: B: 0.033, 95% CI: 0.028, 0.039; r^2=0.38	

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
Wheeler 2020[53]	Cross-sectional	Virginia USA	Census tract (N=1,820)	Bayesian spatial Poisson regression	5-year American Community Survey (2012-2016) Created socioeconomic status index comprised of 12 weighted variables: Gini index of income inequality; % black population; % with bachelor's degree; % families in poverty; % households with public assistance income; % vacant housing units; % renter occupied housing units; median household income; median gross rent; median monthly housing costs; % Hispanic population, % US citizen	Ground-truthing (via driving every primary and secondary road) to identify retailers from publicly available data and protocol developed by Virginia Department of Behavioral Health and Developmental Services and CounterTools (2016-2018) Study authors used websites to confirm store types in December 2018 (Google Maps, Yelp, Yellow Pages, business websites)	Tobacco retailers (N=5600)	Count of tobacco retailers	ES1: Relative risk: 1.22, 95% CI: 1.19, 1.27	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: Yes NA2: Yes Total: 6
					Created socioeconomic status index comprised of 12 weighted variables: Gini index of income inequality; % black population; % with bachelor's degree; % families in poverty; % households with public assistance income; % vacant housing units; % renter occupied housing		*Vape shop retailers ("specialty shops", p. 2) (N=167)* *Store types: convenience stores and gas stations; grocery stores; mass merchandisers; drug stores or pharmacies; tobacco shops; e-cigarette and vape*	*Count of vape shop retailers*	*ES2: Relative risk: 1.20, 95% CI: 1.05, 1.38*	

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					units; median household income; median ross rent; median monthly housing costs; % Hispanic population, % US citizen		*shops; bars and restaurants; hookah lounges*			
Wheeler 2022[54] ***Wheeler 2022***[55+]	Cross-sectional	North Carolina USA	Block group (N=6,083)	Bayesian hierarchical regression	5-year American Community Survey (2014-2018) Created neighborhood disadvantage index comprised of 9 weighted variables: Black population segregation; Hispanic population segregation; percent with ratio of income to poverty level <1; percent households with public assistance income; percent renter occupied housing units; percent homes built 1939 or earlier; percent with no high school degree or higher; percent of household in poverty; per capita income	National Establishment Time Series (2019), using North American Industry Classification System codes	N=7,279 All tobacco retailers	Count of tobacco retailers	ES1: Relative risk: 1.12, 95% credible interval: 1.09-1.14 *A later manuscript (Wheeler, #8604) used similar methods to examine identical relationships but accounts for spatially varying effects, finding "The results revealed substantial variation in NDI effects that varied by outlet type." p.1*	2: Yes 11: Yes 13: No 18: Yes 20: Yes NA1: No NA2: Yes Total: 5
Wood 2013[56]	Cross-sectional	Western Australia Australia	1) All Western Australia suburbs and towns (N=911); 2) Perth	Negative binomial regression with offset of usual residential population	Australian Bureau of statistics (ABS) Index of Relative Socioeconomic Advantage and Disadvantage (IRSAD) (2006) where lower	Western Australia Department of Health by Cancer Council Western Australia (May 2011)	N not specified All tobacco retailers	Count of tobacco retailers per 10,000 residents	All Western Australia suburbs and towns (N=911); IRSAD quartiled percentiles: ES1: Very low (<25th): RR: 4.14, 95% CI: 3.00, 5.71, p<0.001	2: Yes 11: Yes 13: Yes 18: Yes

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Author (Year), ID	Study Design	Study Location	Unit of Analysis (N)	Statistical Approach	Data Source (Year): Area-Level Sociodemographic Variable	Data Source (Year): Tobacco Retailers	Number and Type of Tobacco Retailers Included	Area-Level Outcome Variable Operationalization	Unadjusted Effect Sizes	Risk of Bias
			metropolitan suburbs (N=296); 3) Regional areas/centers outside Perth (N=608)		values represent more disadvantage 2006 Census: suburb or town population (used in tobacco retailer density measure)				ES2: Low (25th to <50th): RR: 2.12, 95% CI: 1.55, 2.92, p<0.001 ES3: High (50th to <75th): RR: 1.43, 95% CI: 1.15, 1.79, p<0.001 Very high (>/=75th): 1.00 (ref) Perth metropolitan suburbs (N=296); IRSAD quartiled percentiles: ES4: Very low (<25th): RR: 1.48, 95% CI: 1.17, 1.87, p<0.001 ES5: Low (25th to <50th): RR: 1.19, 95% CI: 0.94, 1.52, p=0.157 ES6: High (50th to <75th): RR: 1.10, 95% CI: 0.87, 1.40, p=0.430 Very high (>/=75th): 1.00 (ref) Regional areas/centers outside Perth (N=608); IRSAD quartiled percentiles: ES7: Very low (<25th): RR: 5.51, 95% CI: 4.12, 7.36, p<0.001 ES8: Low (25th to <50th): RR: 2.60, 95% CI: 2.00, 3.38, p<0.001 ES9: High (50th to <75th): RR: 1.87, 95% CI: 1.34, 2.60, p<0.001 Very high (>/=75th): 1.00 (ref)	20: Yes NA1: Yes NA2: Yes Total: 7

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Yu 2009[57]	*Cross-sectional*	*New Jersey* *USA*	*Census tract (N=1,938)*	*Adjusted R^2*	*Census (2000)* *Percentage of African American residents* *Percentage of Hispanic (or Latino) residents* *Median household income*	*New Jersey Department of Treasury (2004)*	*N=15,037* *All licensed tobacco retailers*	*Count of tobacco retailers per 10 kilometers of roadway*	*No unadjusted effect sizes reported.* *"When GWR is estimated using the raw data, we find that there is no significant spatial variation of the coefficients between tobacco outlet density and percentage of African American and Hispanics. After transforming the dependent variable and making the residual asymptotically normal, all coefficients exhibit significant variation across space." p.329*	*2: Yes* *11: Yes* *13: No* *18: Yes* *20: Yes* *NA1: Yes* *NA2: Yes* *Total: 6*
Yu 2010[58]	*Cross-sectional*	*New Jersey* *USA*	*Census tract (N=1,938)*	*Spatial linear regression*	*Census (2000)* • *Median household income* • *Percentage of African American residents* • *Percentage of Hispanic residents*	*New Jersey Department of Treasury (2004)*	*N=13,984* *All licensed tobacco retailers*	*Count of tobacco retailers per 10 kilometers of road (base 10 log transformation of outcome variable)*	*No unadjusted effect sizes reported.* *"In New Jersey, the percentage of Hispanics seems to be the dominant demographic factor associated with tobacco outlet distribution, followed by median household income and percentage of African Americans." p.412*	*2: Yes* *11: Yes* *13: No* *18: Yes* *20: Yes* *NA1: Yes* *NA2: Yes* *Total: 6*

Notes: We used a modified Downs and Black checklist to assess the risk of bias (see online repository protocol). We created a risk of bias index (0-7, with higher numbers indicating higher risk of bias) and *a priori* planned to exclude any studies with a score of 4 or higher (none were excluded).
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