Retail Tobacco Density & Access

30 City Data Overview

City	# of tobacco retailers	% of public schools w/in 1.000 ft of a tobacco retailer[a]	X times more tobacco retailers per square mile in lowest- vs. highest-income neighborhoods	X times more tobacco retailers than McDonald's	X times more tobacco retailers than Starbucks	% of city residents living within a half mile of a tobacco retailer	% of tobacco retailers within 500 feet of another tobacco retailer[b]
30 city data (average except where indicated)	40,856 (total)	63% (average)	4.7 (average)	31 (total)	16 (total)	70% (average)	54% (average)
Atlanta, GA	738	47.2%	2.8	53	17	62%	66.1%
Baltimore, MD	1,384	87.4%	5.0	63	66	80%	65.6%
Boston, MA	794	87.5%	2.8	42	10	91%	57.2%
Charlotte, NC	1,032	43.1%	3.1	33	14	42%	44.2%
Chicago, IL	2,086	71.8%	1.1	19	11	88%	49.6%
Cleveland, OH	618	76.7%	1.3	36	36	84%	52.1%
Dallas, TX	1,410	43.9%	7.2	24	17	54%	44.0%
Denver, CO	627	49.5%	1.8	23	8	63%	52.5%
Detroit, MI	1,074	61.7%	1.1	40	90	85%	48.8%
Fort Worth, TX	918	38.2%	8.2	30	21	49%	42.0%
Houston, TX	4,019	61.5%	1.4	24	20	67%	42.9%
Kansas City, MO	458	40.4%	9.5	18	15	43%	46.1%
Las Vegas, NV	614	34.8%	c	18	12	50%	57.8%
Los Angeles, CA	3,759	73.2%	7.0	32	14	81%	68.7%
Memphis, TN	1,124	55.2%	12.2	32	36	59%	59.6%
Miami, FL	1,215	90.1%	2.6	81	64	93%	76.4%
Minneapolis, MN	325	51.9%	7.2	33	14	70%	49.5%
New Orleans, LA	2,089	76.7%	3.5	149	123	79%	74.4%
New York City, NY	7,010	94.1%	2.7	35	20	94%	63.0%
Oakland, CA	400	79.1%	9.7	40	24	82%	43.3%
Philadelphia, PA	2,548	90.1%	4.0	62	44	91%	56.7%
Phoenix, AZ	1,067	41.1%	10.6	16	8	50%	54.4%
Portland, OR	623	58.1%	c	33	7	73%	50.9%
Providence, RI	199	80.3%	5.5	50	25	84%	49.2%
Sacramento, CA	369	32.8%	4.6	23	7	48%	44.4%
San Antonio, TX	1,411	47.2%	4.6	18	19	55%	43.4%
San Diego, CA	842	47.5%	c	21	6	50%	46.7%
San Francisco, CA	705	81.5%	1.6	59	9	92%	54.3%
Seattle, WA	599	54.1%	4.2	43	5	74%	46.4%
Washington, DC	799	81.8%	1.2	30	10	83%	62.7%

[a] Straightline distance from school boundary; 1000 ft is approximately two city blocks.
[b] Roadway distance
[c] Median of zero retailers in the highest-income quartile

Methods

Most ASPiRE cities are members of the Big Cities Health Coalition, which is a forum for the leaders of America's largest metropolitan health departments (https://www.bigcitieshealth.org/). Four cities were added for geographic representation or for the early adoption of sales restrictions on flavored tobacco.

DATA SOURCES

Tobacco retailers. Stanford processed more than 1.3 million records to create the 30 city-specific lists. Almost all data were obtained from local (12 cities) or state (11 cities) tobacco retailer licensing lists. For the remaining cities, data were obtained from state, county, or local enforcement lists (four cities), or from purchased address lists from Reference USA and Dun & Bradstreet (three cities). Initial files were filtered to retain only active tobacco retailers and exclude non-tobacco retailers or inactive businesses. To exclude retailers located outside incorporated city limits, lists were geocoded to jurisdiction using ArcGIS 10.6.1 (ESRI, Redlands, CA). Tobacco retailers include a variety of store types, such as gas stations, convenience and corner stores, and grocery stores. In most cities, retailer lists included vape shops.

McDonald's and Starbucks data were obtained from AggData (2020).

School shapefiles. School addresses are typically geocoded and assigned latitude and longitude values representing a single point on a map. However, these points do not accurately reflect actual school boundaries and impede efforts to precisely measure tobacco retailer access near schools. In partnership with GreenInfo Network, Stanford curated school boundary GIS shapefiles for the 30 cities (n=8,904 schools). GIS shapefiles for the remaining eight cities were created as part of a prior collaboration. More details about this process are available here: http://www.californiaschoolcampusdatabase.org.

City boundary shapefiles were obtained from the U.S. Census Bureau Geography Program (TIGER/Line Shapefiles and Cartographic Boundary Shapefiles) or local city government GIS data repositories.

Census tract shapefiles, land area data, and roadway miles data were obtained from TIGER/Line Shapefiles (machine-readable data files) prepared by the U.S. Census Bureau, 2019 (https://www.census.gov/cgi-bin/geo/shapefiles/index.php).

City block length data were identified from Internet searches for 19 of 30 cities. In the remaining cities, block length was estimated to be 540 feet, the average of the 19 cities with available data.

Population size and median household income data were obtained from the U.S. Census Bureau, American Community Survey 5-Year Estimates (2013-2017, https://data.census.gov/cedsci/).

DATA ANALYSIS

We calculated summary statistics as follows:

- **% of Public Schools w/in 1000 ft of a tobacco retailer:** Distance from school boundaries to tobacco retailers was calculated as straight line distance.

- **X times more tobacco retailers per square mile in lowest- vs. highest-income neighborhoods:** Calculated as median density (retailers/per square mile) in lowest-income census tracts (bottom quartile) divided by median density in highest-income census tracts (top quartile); three cities with median values of zero in highest-income quartile were excluded. All density analyses were conducted for census tracts that fell within or intersected the city boundaries. To calculate the land area for each tract, we multiplied the value of each variable by the proportion of the tract area within the city boundary.

- **X times more tobacco retailers than McDonald's and X times more tobacco retailers than Starbucks:** Total number of McDonald's and Starbucks in each city divided by the total number of tobacco retailers in each city.

- **% of city residents living within a half mile of a tobacco retailer:** Proximity measures were calculated in ArcGIS 10.7.1 (ESRI, Redlands, CA) using a ½ mile road network service area. We calculated percent of residents within ½ mile of a tobacco retailer as the percent of each census tract covered by the road network service area buffer, multiplied by the tract population, and summed across all tracts within the city boundary.

- **% of tobacco retailers within 500 feet of another tobacco retailer:** Distance between tobacco retailers was calculated as road network distance. The percent of retailers within 500 feet of another only considers tobacco retailers inside the city boundary.

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