

Retail Tobacco Density & Access

What the ASPIRE Research Shows

The tobacco industry spends nearly \$1,000,000 every hour on retail advertising and price discounts to support sales at hundreds of thousands of tobacco retailers in the United States. Living in neighborhoods with a higher concentration of tobacco retailers makes youth more likely to start using tobacco and makes quitting more difficult.¹⁻³ In addition, higher concentrations of tobacco retailers in disadvantaged neighborhoods contribute to health disparities.⁴⁻⁵

The National Cancer Institute-funded ASPIRE Center—a partnership that includes tobacco control leaders in 30 major cities and researchers from the Stanford University School of Medicine, the University of North Carolina at Chapel Hill, and Washington University in St. Louis—mapped tobacco retailers in these 30 cities and developed tailored Tobacco Retailer Density Fact Sheets and “Tobacco Swamps” Maps. These fact sheets provide each city with usable snapshots of its tobacco retail environment. The resources can be used to support the increasing number of local tobacco control interventions that limit the location, type, and quantity of tobacco retailers, as well as the types of tobacco products that are allowed to be sold.

Together, the fact sheets and maps illustrate that across the ASPIRE cities, tobacco retailers are:

- **Located near schools:** On average, 63% of public schools are within 1,000 feet (about 2 city blocks) of a tobacco retailer. This ranged from 33% in Sacramento to 94% in New York City.
- **Concentrated in lower-income areas:** On average, the number of tobacco retailers per square mile is nearly 5 times more in the lowest-income neighborhoods than in the highest-income neighborhoods. This difference was largest in Memphis (over 12 times more) and smallest in Chicago (no difference).
- **Easy to access:** On average, 70% of city residents live within ½ mile (~10 minute walk) of a tobacco retailer. This ranged from 42% in Charlotte to 94% in New York City. Maps illustrate “tobacco swamps,” which are areas with a glut of tobacco retailers.
- **Clustered together:** On average, 54% of tobacco retailers are within 500 feet (~2 minute walk) of another tobacco retailer. This ranged from 42% in Fort Worth to 76% in Miami.
- **Ubiquitous:** There are 31 times more tobacco retailers than McDonald’s restaurants and 16 times more retailers than Starbucks. In the 30 ASPIRE cities, there are 40,856 tobacco retailers.

About the ASPIRE Center

Funded by the National Cancer Institute, Advancing Science and Practice in the Retail Environment (ASPIRE) is a collaborative that investigates how tobacco retailer density and innovative retail tobacco interventions impact people and communities. The Center’s goal is to build a strong base of scientific evidence for effective retail policies to reduce tobacco use, tobacco-related disparities, and the public health burden of tobacco. ASPIRE researchers from the Stanford University School of Medicine, the University of North Carolina at Chapel Hill, and Washington University in St. Louis work in partnership with a Community Advisory Board (CAB) comprised of tobacco control program staff from 30 large U.S. cities, representatives from several tobacco control organizations and agencies, and legal experts. Approximately 29 million adults and 8 million children (1 in 9 U.S. residents) live in the 30 ASPIRE CAB cities.



(See page 2 for METHODS)

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:

- **Located near schools; Easy to access; Clustered together:** Average of city-specific percentages (additional detail below); walking distance assumes a ~20 minute mile. The percent of retailers within 500 feet of another only considers tobacco retailers inside the city boundary.
- **Concentrated in lower-income neighborhoods:** The calculation is an average of city-specific 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.
- **Ubiquitous:** Total number of McDonald's and Starbucks across the 30 cities divided by the total number of tobacco retailers across the 30 cities.

Tobacco Retailer Density Fact Sheets. All density analyses were conducted for census tracts that fell within or intersected the city boundaries. To calculate the land area, roadway miles, and population for each tract, we multiplied the value of each variable by the proportion of the tract area within the city boundary. Distance between tobacco retailers was calculated as road network distance. Distance from school boundaries to tobacco retailers was calculated as straight line distance.

Tobacco Swamps Maps. These maps were created using ArcGIS 10.7.1 (ESRI, Redlands, CA). Proximity measures were calculated using 1,000 foot and ½ mile road network service areas. We calculated percent of residents within 1,000 feet and 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.

REFERENCES

1. Marsh L, Robertson L, Vaneckova P, Johnson TO, Doscher C, Schleicher NC, Henriksen L. Association between density and proximity of tobacco retail outlets with smoking: A systematic review of youth studies. *Journal of Health & Place*. 2020. doi: 10.1016/j.healthplace.2019.102275
2. Magid HS, Halpern-Felsher B, Ling PM, Bradshaw PT, Mujahid MS, Henriksen L. Tobacco retail density and initiation of alternative tobacco product use among teens. *Journal of Adolescent Health*. 2020 Apr; 66(4):423-30. doi: 10.1016/j.jadohealth.2019.09.004. PMID: 31784411
3. Chaiton MO, Mecredy G, Cohen J. Tobacco retail availability and risk of relapse among smokers who made a quit attempt: A population-based cohort study. *Tobacco Control*. 2018 Mar;27(2):163-169. doi: 10.1136/tobaccocontrol-2016-053490. Epub 2017 Apr 21. PMID: 28432213
4. Lee JG, Sun DL, Schleicher NC, Ribisl KM, Luke DA, Henriksen L. Inequalities in tobacco outlet density by race, ethnicity, and socioeconomic status, 2012, USA: Results from the ASPIRE Study. *Journal of Epidemiology and Community Health*. 2017 May; 71(5): 487-92. doi: 10.1136/jech-2016-208475. PMID: 28249990
5. Leas EC, Schleicher NC, Prochaska JJ, Henriksen L. Place-Based Inequity in Smoking Prevalence in the Largest Cities in the United States. *JAMA Internal Medicine*. 2019 Mar 1;179(3):442-4. doi: 10.1001/jamainternmed.2018.5990. PMID: 30615029