California Tobacco Retail Surveillance Study 2023 Results

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ABSTRACT
The 2023 California Tobacco Retail Surveillance Study (CTRSS) characterized the visibility and marketing of tobacco products in a stratified random sample of 1,280 state-licensed tobacco retailers (LTRs). Product visibility was measured overall and by flavor category for: (1) any tobacco product, (2) cigarettes, (3) nicotine pouches, (4) nicotine vapes, (5) cigarillos, and (6) other tobacco (chew/dip/snus, tobacco leaf wraps). Data were collected from July-November 2023, approximately seven to 11 months after California law (Senate Bill [SB] 793) prohibited sales of flavored tobacco (with few exceptions). Notably, explicit-flavored tobacco products were visible in more than one third (37.9 percent) of observed LTRs. Visibility varied by store type and product category. The majority of tobacco specialty shops (71.4 percent) displayed explicit-flavored tobacco, followed by 44.7 percent of liquor stores, 38.9 percent of convenience stores, and approximately 22.0 percent of pharmacies, discount stores, and small markets. Menthol cigarettes were visible in only 3.5 percent of LTRs in 2023. However, the odds of an LTR having visible menthol cigarettes increased as the percent of non-Hispanic/Latino Black residents in a store neighborhood increased. For every 10 percentage-point increase in percent of non-Hispanic/Latino Black residents, the odds that menthol cigarettes were visible increased by 74 percent. Flavored cigarillos were visible in 30.8 percent of LTRs and explicit-flavored nicotine vapes in 13.3 percent. Surprisingly, visibility of tobacco products with ambiguous flavor names did not proliferate after SB 793.

EXECUTIVE SUMMARY
This report summarizes findings from the California Tobacco Retail Surveillance Study (CTRSS) 2023 data collection, the second data collection from a representative sample of 1,280 state-licensed tobacco retailers (LTRs) that were first assessed in 2022 (n=1,277, n=1,137 with data for both CTRSS 2022 and 2023). The CTRSS 2023 sample was designed with an oversample of LTRs in each of three categories: (1) self-identified rural counties, (2) census tracts in the 90th percentile or higher of non-Hispanic/Latino Black residents, and (3) tobacco specialty shops. Sampling weights were computed and applied to yield results representative of all LTRs in California in 2023, and for analysis of change over time in these LTRs (before and after Senate Bill [SB] 793 went into effect). The current report focuses on visibility and marketing of flavored tobacco products, by product category and store type. It also assesses whether the visibility of tobacco products with ambiguous flavor names (concept-flavored) increased. With concern for health equity, the CTRSS 2023 report also examines whether there are place-based differences in the visibility of explicit-flavored tobacco.

- Visibility of explicit-flavored tobacco decreased from 86.0 percent of LTRs in 2022 to 37.9 percent in 2023.
- Visibility of concept-flavored tobacco did not increase substantially: from 59.6 percent in 2022 to 63.1 percent in 2023.
- Visibility of explicit-flavored tobacco ranged from 71.4 percent in tobacco specialty shops to 9.2 percent in supermarkets in 2023.
- Explicit-flavored cigarillos were the most visible flavored tobacco product (30.8 percent of stores).
- Menthol cigarettes were the least visible flavored tobacco product (3.5 percent of stores).
- Odds of an LTR having menthol cigarettes, explicit-flavored nicotine vapes, and any explicit-flavored tobacco increased as the percent of non-Hispanic/Latino Black residents in a store neighborhood increased.

- Odds of an LTR having any nicotine pouches decreased as the percent of Hispanic/Latino residents increased, as the percent of non-Hispanic/Latino Black residents increased, and as the percent of residents living in poverty increased.
- Across all product categories and store types, tobacco specialty shops had the highest odds of violating SB 793 by displaying explicit-flavored tobacco for sale.
- Few stores advertised flavored tobacco products they could not sell.
- Results from CTRSS 2023 suggest tobacco specialty shops, as well as explicit-flavored cigarillos and nicotine vape products, as areas of focus for enhanced enforcement of SB 793.

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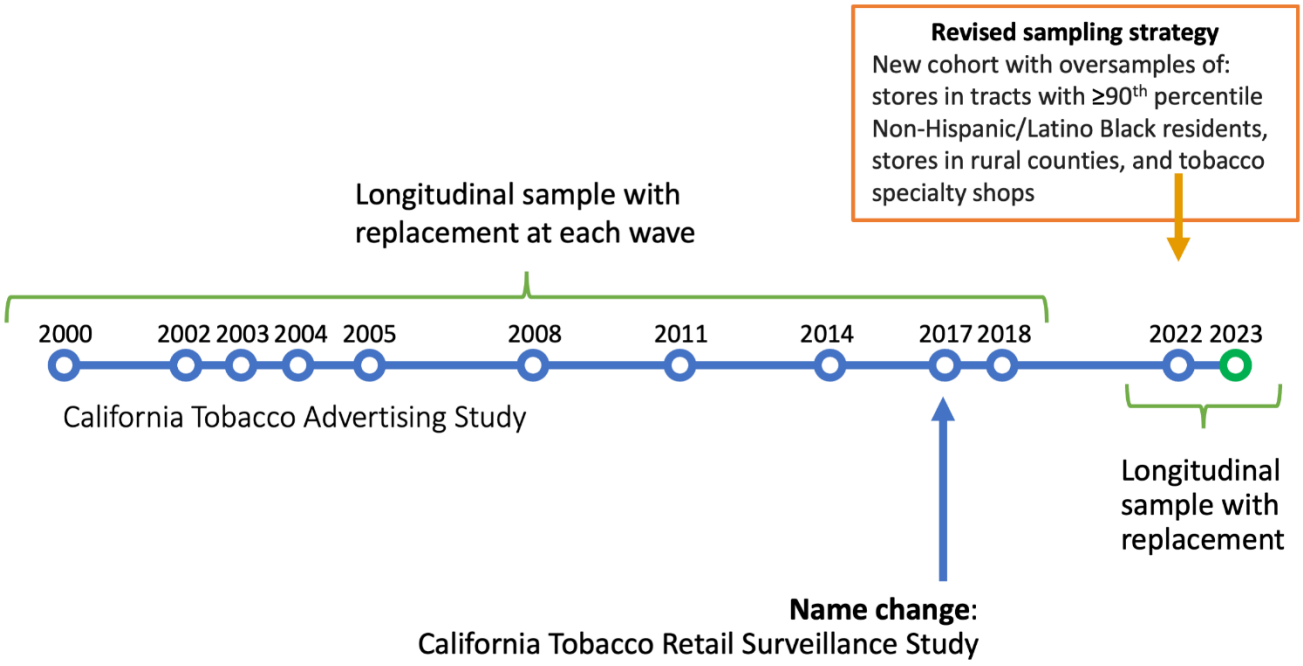
BACKGROUND

The California Tobacco Retail Surveillance Study (CTRSS), previously known as the California Tobacco Advertising Study (CTAS), is the longest-running tobacco retail marketing surveillance system in the United States (US).[1] The California Tobacco Prevention Program (CTPP) has funded 12 waves of retail observations since 2000, as shown in Figure 1.

Figure 1. Timeline of retail marketing observations in California since 2000



The 2022 and 2023 CTRSS waves were designed to assess the tobacco retail environment before and after the effective date of California Senate Bill (SB) 793, which prohibits the sale of flavored tobacco products and flavor enhancers in brick-and-mortar stores, with limited exceptions.[2] Effective December 21, 2022, the law exempts restrictions on the sale of flavored premium cigars and loose-leaf tobacco, as well as flavored shisha tobacco, when sold in LTRs that limit entry to those age 21 years and over.

CTRSS 2023 data were collected between July and November 2023, approximately seven to 11 months after SB 793. Therefore, CTRSS 2023 was designed to assess change over time in the presence (visibility) of flavored tobacco products and marketing, focusing on products that are not exempt from the state law. Additionally, CTRSS 2023 monitored products that were new or had increased presence in the tobacco retail environment, which may be indicative of the tobacco industry's response to SB 793. This report characterizes the tobacco retail environment in California after SB 793, and compares data from CTRSS 2022 and CTRSS 2023, focusing on changes in flavored tobacco product visibility and marketing.

METHODS

Sample

The CTRSS 2023 data collection sample consisted of licensed tobacco retailers (LTRs) from the CTRSS 2022 analysis sample, with replacements for n=140 LTRs lost to attrition. The CTRSS 2022 sample was a stratified random sample with oversamples in three categories: (1) LTRs located in rural counties; (2) LTRs located in census tracts in the 90th percentile or higher of percent non-Hispanic/Latino Black residents; and (3) tobacco specialty shops (smoke/vape shops and hookah bars). Lists of LTRs were provided by CTPP, sourced from California Department of Tax and Fee Administration (CDTFA), using a January 2022 CDTFA list for CTRSS 2022, and a February 2023 list for CTRSS 2023 replacement stores.[3] Both CDTFA lists were geocoded using ArcMAP (100 percent mapping rate). A measure of census tract percentile of non-Hispanic/Latino Black residents, computed statewide for California using American Community Survey (ACS) 5-year tract estimate data, was then merged into the geocoded CDTFA datasets. County rurality was classified according to CTPP's Health Jurisdiction Characteristics by Project (2022-2025). For sampling purposes, tobacco specialty shops were identified using North American Industry Classification System (NAICS) code data from CDTFA lists and keywords in store names (e.g., vape, e-cigarettes, tobacco). The CTRSS 2022 and 2023 samples consisted of six strata, as too few stores were present in the group combinations of rural county, 90th percentile or higher of percent non-Hispanic/Latino Black residents, and tobacco specialty shop (yes or no) to yield separate strata, so these stores were aggregated with non-rural equivalent strata.

We telephone-verified stores to fill replacement quotas by strata (rural county vs. non-rural county, census tract population non-Hispanic/Latino Black ≥ 90th percentile vs. < 90th percentile, tobacco specialty shop vs. other store type. To do this, trained professionals followed a standard protocol and used a computer-assisted telephone interview system to ask whether LTRs sold an individual tobacco product, until the answer was affirmative. The first product asked about was Natural American Spirit cigarettes. If none were sold, they asked about any other cigarettes or other combustible tobacco products such as cigars or hookah. If none were sold, they asked about JUUL pods, followed by Puff Bar or other nicotine vapes. Trained professionals made at least three attempts to telephone each store using telephone numbers found online, and any alternate phone numbers found on Google, Yelp, or YellowPages.com for stores with numbers that were disconnected, routinely busy, or going straight to voicemail. To improve completion rate, repeat calls were attempted at varying times of day. Telephone verifications were performed by Ewald & Wasserman, LLC (E&W), the same agency that conducted the tobacco retail surveillance.

Data collector training

Stanford Prevention Research Center (SPRC) staff led a two-day training session in San Jose, CA at the Sobrato Center for Nonprofits, a professional office building located near a variety of LTRs that sell tobacco, for field experience from June 29 to June 30, 2023. Professional data collectors received both printed and electronic copies of the instruction manual in advance. Training activities included 1.5 days of classroom instruction, two field visits to nearby stores that sold tobacco, and additional classroom

activities. For example, data collectors were asked to sort a variety of tobacco products into flavor categories, use products to construct a tobacco display "power wall," and identify flavored tobacco products in photographs from actual stores. SPRC mapped all LTRs within a short drive (5.0 miles) of the Sobrato Center. On the first day of training, SPRC and E&W staff drove groups of three to four data collectors to pre-identified clusters of three to four sites with different store types (e.g., convenience store, tobacco specialty shop, pharmacy). Data collectors completed the survey in each LTR and interacted with clerks as needed. On the second day of training, SPRC and E&W staff drove data collectors to a new cluster of seven LTRs that were surveyed by SPRC staff one or two days prior. The purpose of this task was to compare data collector responses with a "gold standard." Data collectors were each assigned store routes and asked to complete the survey in three of the seven LTRs. SPRC reviewed the data to identify items with low agreement between data collectors visiting the same LTRs and the gold standard. Using these findings, SPRC developed additional training slides and an online assessment for the most complicated items (poor agreement with the gold standard). SPRC led an additional hour of data collector training via Zoom that was scheduled approximately two days after the in-person training. At that session, SPRC staff addressed further questions from data collectors and clarified instructions as needed.

Fieldwork

Data were collected between July 22 and November 20, 2023, approximately seven to 11 months after SB 793. To assess inter-rater reliability, second visits were completed by a different data collector than the first visit in randomly selected stores (n=136). Mean number of days between visits was 6.0 (SD=7.1, Minimum=0, Maximum=71).

Measures

This section summarizes the key measures from the CTRSS 2023 retail surveillance instrument that are featured in this report and any changes since 2022 (see Table 1). This section also describes composite measures (combining multiple survey items) that are used in the current analyses, such as visibility of any explicit-flavored tobacco. Appendix II contains the full text of the CTRSS 2023 survey instrument.

CTRSS 2023 categorized tobacco products into three mutually exclusive flavor categories: explicit, concept, and unflavored (see Table 1). Explicit flavors mention or display an image of a food, beverage or other explicit taste (e.g., mint/menthol, fruit, candy, alcohol). Concept flavors are marketed with ambiguous flavor names that do not refer to an explicit taste, such as colors or experiential terms (e.g., blue, jazz, cotton clouds, tropical mist). Unflavored products are marketed as lacking a characterizing flavor (e.g., clear, naked, flavorless). Text and images on tobacco products were used to classify them as being explicit-flavored, concept-flavored, or unflavored. Products marketed as tobacco flavored (e.g., bold, natural, Virginia) were not included in the three flavor categories. Not all product types were categorized into three flavor categories, due to variation in availability of flavor categories by product type.

Key measures

Store type. As in 2022, data collectors classified LTRs into one of eight categories: convenience (with or without gas), small market/produce market (small market), liquor store, supermarket/large grocery store, discount store (including Walmart), pharmacy, tobacco specialty shop (vape/smoke/head shop/hookah) and other (e.g., hotel gift shop, gas kiosk). Owing to small sample size, discount stores were combined with the other category for analysis. Different from the CTRSS 2022 report, convenience stores and small markets were not combined for analysis because of differences between these two store types for multiple key measures.[4] This decision yielded seven categories for store type: convenience store, discount or other, liquor store, pharmacy, small market, supermarket/large grocery store, and tobacco specialty shop.

Table 1. Summary of product type and measures reported in CTRSS 2023

	Cigarettes	Nicotine pouches	Vape products	Cigarillos	Chew/dip/snus	Tobacco leaf wraps	Flavor enhancers
Product visibility							
Any	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Explicit-flavored	Yes	Yes	Yes	Yes	Yes	Yes	No
Concept-flavored	Yes	No	Yes	No	No	No	No
Unflavored	No	No	Yes	No	No	No	No
Advertisements							
Any	No	Yes	No	No	No	No	No
Explicit-flavored	Yes	No	Yes	Yes	No	No	No
Concept-flavored	Yes	No	No	No	No	No	No
Discounts							
Explicit-flavored	Yes	No	No	No	No	No	No

Note: "Explicit-flavored cigarettes" refers to menthol cigarettes, "Concept-flavored cigarettes" refers to "non-menthol" labeled cigarettes, and "Advertisements" include both interior and exterior.

Product visibility. Different from the CTRSS 2022 report, the current report refers to product visibility rather than availability. The reason for this change is to acknowledge that LTRs may sell flavored tobacco products that are not visible to customers, enforcement agents, or data collectors.[5] As in CTRSS 2022, data collectors coded what products were visible at the point of sale. They did not ask store clerks whether they could purchase flavored tobacco. Thus, product visibility (CTRSS 2023) and product availability (CTRSS 2022) are comparable items. Visibility was likely a valid estimate of product availability in 2022. However, after SB 793, it is possible that visibility underestimates product availability, as tobacco products that are not legal for sale may be hidden from view in areas that are not visible to customers or enforcement agents.

Cigarettes. As in CTRSS 2022, data collectors noted the visibility of any cigarettes (regardless of flavor) and menthol cigarettes. New to CTRSS 2023, data collectors recorded the visibility of "non-menthol" labeled cigarettes.[6] These products, many of which provide a cooling sensation, were introduced in California in December 2022 to coincide with SB 793.[6]

Nicotine pouches. As in CTRSS 2022, visibility of nicotine pouches was assessed by first looking for ZYN, which remains the leading brand.[5] If ZYN was not visible, data collectors looked for other brands of nicotine pouches (e.g., on!, Velo). If either ZYN or other brands of nicotine pouches were visible, a follow-up item measured whether explicit-flavored nicotine pouches were visible. Concept-flavored nicotine pouches were not assessed due to limited availability and prioritizing explicit-flavored tobacco.

Nicotine vape products. Data collectors noted whether any nicotine vape products were visible, including disposables, vape pods or cartridges, and e-liquids. If nicotine vape products were visible, follow-up items assessed visibility of each of three flavor categories: explicit, concept, and "unflavored."

Cigar products. Data collectors noted separately whether cigarillos and little filtered cigars were visible, regardless of favor. If visible, follow-up items assessed visibility of explicit- and concept-flavored varieties of these products. Unflavored varieties were not assessed. Little filtered cigars were excluded from this analysis due to low inter-rater reliability. Large cigars were excluded from CTRSS 2023 due to data collector burden, such as requiring permission to enter/view climate-controlled rooms/storage.

Smokeless tobacco and tobacco leaf wraps. Data collectors noted the visibility of other smokeless tobacco by product type: chew/dip/snus, and tobacco leaf wraps. If visible, follow-up items measured visibility of explicit-flavored varieties of the two product types. Concept-flavored and varieties marketed as unflavored were not assessed due to low prevalence and prioritizing explicit-flavored tobacco.

Flavor enhancers. New to CTRSS 2023, data collectors recorded the visibility of products that allow people who smoke to add menthol flavor to tobacco by inserting a flavor card into a cigarette pack or dripping menthol oil into unflavored vape liquid. SB 793 prohibits such flavor enhancers; therefore, visibility indicates non-compliance with state law.

Advertising. Advertisements were defined as branded, professionally-produced (not handwritten) signs intended to sell a product. No minimum size was specified. Signs included neon lights and other three-dimensional objects, such as sandwich boards or signs wrapped around concrete bollards. Branded signs for mobile coupons also counted as advertisements. This report focuses on advertising for five tobacco products: menthol cigarettes, "non-menthol" labeled cigarettes, nicotine pouches, explicit-flavored nicotine vapes, and explicit-flavored cigarillos. Data for advertising were recorded separately for the interior and exterior of each LTR.

Discounts. A discount was defined as a temporary price reduction, including dollar or cents off, or a reduced price for a multi-pack purchase. Presence of any cigarette discount was assessed on the inside and outside of the store, separately. Among the subset of stores with any cigarette discount, a follow-up item measured presence of a discount for "non-menthol" labeled cigarettes. Data collectors were trained to look for discounts on advertisements, shelf strips, stickers, and product packaging. Discounts could be handwritten or professionally printed. Membership-only, app-only and mobile coupons were included in the definition of discounts.

Composite measures. Multiple composite measures were computed for analyses. Two composite measures of flavored tobacco product visibility were computed: (1) any explicit-flavored tobacco (chew/dip/snus, cigarillos, menthol cigarettes, nicotine pouches, and/or nicotine vape products); and (2) any concept-flavored tobacco (cigarillos and/or nicotine vape products). Unlike concept flavors, "non-menthol" implies the absence of an explicit flavor. Therefore, "non-menthol" labeled cigarettes were not included in the composite measure of concept-flavored tobacco because the name did not convey an ambiguous flavor, color, or experience. Two composite measures related to nicotine pouch visibility and advertisements were computed: any nicotine pouches visible (ZYN, other brands), and any nicotine pouch advertisements (interior and/or exterior). Three composite measures specific to cigarette advertisements and discounts were computed: any menthol cigarette advertisements (interior and/or exterior), any "non-menthol" labeled cigarette advertisements (interior and/or exterior), and any "non-menthol" labeled cigarette discounts (interior and/or exterior).

Analyses

Inter-rater reliability (IRR). This statistic describes the extent (beyond chance) to which two independent data collectors agreed on the assessment of product visibility or presence of marketing in the same LTRs. To assess IRR, Cohen's kappa statistics were computed using data from all 136 LTRs

with a repeat visit by a different data collector than the primary visit.[7] Notably, Cohen's kappa is not an appropriate indicator of IRR for measures with very high (>90 percent) or low (<10 percent) prevalence. For such measures, and for measures with Cohen's kappa values below 0.50, an alternative IRR statistic was computed: the prevalence adjusted, biased adjusted kappa (PABA kappa).[8]

In this report, measures with IRR kappa statistics greater than or equal to 0.50 were eligible for modeling, measures with IRR statistics between 0.40 and 0.49 were eligible for descriptive statistics but were not modelled, and measures with IRR statistics less than 0.40 were ineligible for reporting and further analysis. For example, descriptive statistics are presented for visibility of explicit-flavored cigarillos (kappa=0.48), but the measure was not modelled.

IRR for visibility of little filtered cigars did not meet the minimum threshold for analysis (PABA kappa=0.37), so three measures related to this product were excluded from analyses (any little filtered cigars, explicit-flavored little filtered cigars, and explicit-flavored cigars (cigarillos and/or little-filtered cigars)) (see Appendix I). Visibility of concept-flavored tobacco (PABA kappa=0.49), explicit-flavored cigarillos (kappa=0.48), and explicit-flavored tobacco leaf wraps (PABA kappa=0.48) were eligible for descriptive statistics, but not for modeling. Among the remaining measures that were eligible for descriptive statistics and modeling, IRR statistics ranged from kappa=0.51 for any tobacco leaf wraps visible to 0.91 for explicit-flavored nicotine vape advertisements. As IRR statistics decrease, results should be interpreted and generalizations made with caution.

Geospatial data. SPRC staff used ArcMap version 10.6.1 to geocode LTRs with completed surveys, achieving a 100 percent mapping rate. For CTRSS reports prior to 2022, SPRC created half-mile, store-centered buffers to characterize store neighborhoods. However, starting in the CTRSS 2022 sample, there was sufficient overlap between store buffers that this strategy violated model assumptions. Instead, the current analyses define store neighborhoods using census tracts (stores per tract: Mean=1.3, SD=0.6, Minimum=1, Maximum=6). The 1,280 completed LTRs were nested in 1,024 census tracts and in 56 counties.

SPRC extracted data from the American Community Survey (ACS) 5-year tract estimates (2018-2022) for each store neighborhood, calculating percent of population measures for: race/ethnicity (Hispanic/Latino; non-Hispanic/Latino Black; non-Hispanic/Latino Asian, non-Hispanic/Latino Native Hawaiian and other Pacific Islander; non-Hispanic/Latino American Indian/Alaska Native, multiple races, and other (combined)); residents under 21 years; and poverty (percent of residents with household income less than or equal to 200 percent of the federal poverty level). Non-Hispanic/Latino Asian and non-Hispanic/Latino Native Hawaiian and other Pacific Islander were combined into one category ("non-Hispanic/Latino API"), and non-Hispanic/Latino American Indian/Alaska Native, multiple races, and other were combined into "non-Hispanic/Latino Other race" for analysis. The federal poverty level cut point was increased from 185 percent (used for CTRSS 2022 analysis) to 200 percent for this CTRSS 2023 analysis. Summary statistics (mean and standard deviation) for the CTRSS 2023 store neighborhood measures were computed: 39.6 percent (SD=24.8) Hispanic/Latino residents, 9.1 percent (SD=11.7) non-Hispanic/Latino Black, 9.2 percent (SD=11.5) non-Hispanic/Latino API, 5.0

percent (SD=3.6) percent non-Hispanic/Latino Other race, 26.2 percent (SD=8.4) residents under 21 years, and 34.7 percent (SD=16.6) with income ≤ 200 percent of the federal poverty level. County rurality was classified according to CTPP's Health Jurisdiction Characteristics by Project (2022-2025). Of the 1,024 census tracts in CTRSS 2023, 31.3 percent were in rural counties, which is higher than the statewide percent due to the oversampling of rural stores.

The CTRSS 2023 analysis has two comfvponents: (1) cross-sectional analyses, using data from all LTRs with completed CTRSS 2023 surveys (n=1,280); and (2) longitudinal analyses, that include descriptive statistics computed using data from LTRs with completed CTRSS surveys by year, CTRSS 2022 (n=1,277) and CTRSS 2023 (n=1,280). In addition, longitudinal analyses model the continued visibility of five tobacco products (any explicit-flavored tobacco, menthol cigarettes, nicotine pouches, explicit-flavored nicotine pouches, and explicit-flavored nicotine vapes), using data from the LTRs with completed surveys for both CTRSS 2022 and 2023 (n=1,137).

Cross-sectional analysis

Descriptive statistics. Descriptive statistics with weights applied were computed for each product visibility and marketing measure with a kappa value >0.40 (see Appendix I). Sample sizes for descriptive statistics varied based on the number of data collectors who selected "can't determine" for each item. Data collectors rarely selected "can't determine", ranging from zero to 29 for visibility of explicit-flavored nicotine vapes. For analyses, all binary measures were coded 0=None, 1=Any (at least one).

Multivariable models. Before estimating models, descriptive statistics with weights applied were generated split by store type for each of eight measures: any explicit-flavored tobacco, menthol cigarettes, "non-menthol" labeled cigarettes, flavor enhancers, any nicotine pouches, explicit-flavored nicotine pouches, explicit-flavored nicotine vape products, and concept-flavored nicotine vape products. We modeled product visibility in 2023 for seven measures with sufficient variation, excluding explicit-flavored nicotine pouches. Each measure was modelled as a function of store type and store-neighborhood demographics. For all models, the data were conceptualized as forming a two-level hierarchy, with stores (Level 1), nested within store neighborhoods (census tracts) (Level 2). Multilevel models were estimated, with random intercepts, scaled weights applied at Level 1.

$$(\text{scaled weight} = {}^{\text{weight}}/_{\text{mean weight}})$$

Models included a continuous measure of store neighborhood rurality. We explored using Rural Urban Commuting Area (RUCA) codes to classify store neighborhood rural status. The most recent release of RUCA codes uses decennial 2010 census tract data, and a release of RUCA codes using 2020 decennial census tract data has not yet been released. Owing to potential differences between 2010 and 2020 for census tract population data and resulting rural status, we did not use RUCA codes to classify CTRSS 2023 store neighborhood rurality. Instead, we used a continuous measure, the Index of Relative Rurality, developed by Waldorf and Kim (Purdue University). A version of the Index of Relative Rurality, for US census tracts was developed using census 2020 data by Christian and Rose (University of

Kentucky). The index is computed using data for an area's population size, population density, network density, and percentage of urban area. Higher values of this measure indicate greater rurality. Scores range from zero (least rural) to one (most rural).

Mixed models were fit in SAS using PROC GLIMMIX, with specifications including sandwich estimators (EMPIRCAL=classical), unstructured covariance structure (TYPE=un), and quadrature (METHOD=quad). Outcomes were Level-1 measures, and store type was the Level-1 predictor. Level-2 predictors included store neighborhood measures (race/ethnicity, residents under 21 years, poverty, and the index of relative rurality). For store type, the most prevalent category (convenience store) was the reference category. To yield meaningful coefficients, neighborhood demographic measures were scaled to ten-percentage point intervals for model entry. Thus, a one-unit increase equated to a ten-percentage point increase (i.e., from 15 percent to 25 percent). The index of relative rurality was rescaled from the original zero to one, to values from zero to 100 for models. Initial models conceptualized the data as a three-level hierarchy (LTRs nested in tracts, nested in counties). The three-level models did not improve model fit. Therefore, results from two-level models are presented.

Whenever a binary outcome was a constant (prevalence of approximately less than one percent, or greater than 99 percent) within a store type category, cases within that store type category were excluded from the 2023 cross-sectional models.

For each mixed model, adjusted odds ratios (aOR) and 95-percent confidence intervals (CIs) are presented. Odds ratios greater than 1.00 indicate greater odds of the outcome of interest when the predictor is present (coded 1=present vs. 0=not present) or increases in value (e.g., from ten to 20 percent of Non-Hispanic/Latino Black residents). Odds ratios less than 1.00 indicate lower odds of the outcome of interest when the predictor is present or increases in value. Given an alpha of 0.05, an odds ratio with a 95-percent CI that includes 1.00 is not statistically significant (not related to the outcome of interest). In this report, aORs are derived from mixed models with predictors for store type and store neighborhood (census tract) demographics.

Longitudinal analysis

Descriptive statistics. Using LTRs with completed observations in 2022 (n=1,277) and 2023 (n=1,280), longitudinal analyses included 13 measures related to flavored tobacco visibility and advertising (see Appendix I). Descriptive statistics were generated for longitudinal measures by year (2022 and 2023), applying year-specific weights.

Multivariable models. We modelled continued visibility in 2023 of key tobacco products among the subset of LTRs in which each product was visible in 2022. These analyses used the subset of LTRs with data for both CTRSS 2022 and 2023 (maximum n=1,137). Models were estimated to examine continued visibility in 2023 of five outcomes: any explicit-flavored tobacco, menthol cigarettes, any nicotine pouches, explicit-flavored nicotine pouches and explicit-flavored nicotine vapes. Models examined continued visibility of these products as a function of store type, store-neighborhood demographics, and the index of relative rurality. For each outcome, among the subset of LTRs in which a product was

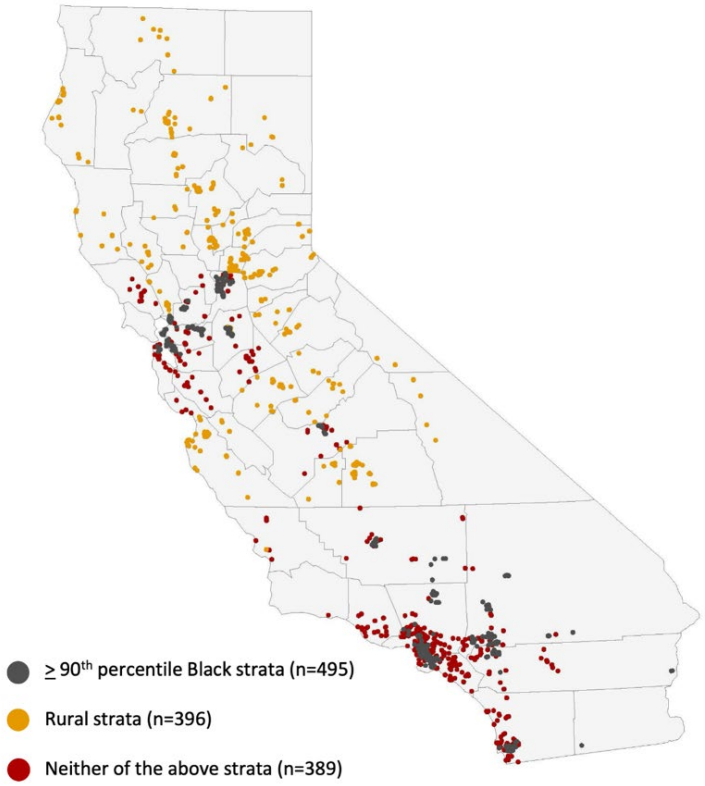
visible in 2022, we generated descriptive statistics split by store type. Using the same subset of LTRs with the product visible in 2022, for each outcome we fit a mixed model (LTRs within neighborhoods) in SAS using PROC GLIMMIX, with the same specifications as the cross-sectional models. The models of continued visibility used scaled weights at Level 1 computed for the subgroup of LTRs with data for both CTRSS 2022 and 2023 (n=1,137). As with cross-sectional models, to yield meaningful coefficients, neighborhood demographic measures were scaled to ten-percentage point intervals for model entry. When descriptive statistics indicated continued visibility was prevalent in only one or two store type categories, or cell count was small within a store type category, the reference category included all other store types collapsed (those with zero to very low prevalence and small cell size).

Data management and descriptive statistics were executed using IBM SPSS Statistics for Windows, V29.0.0.0; mixed models were fit using SAS 9.4.

RESULTS

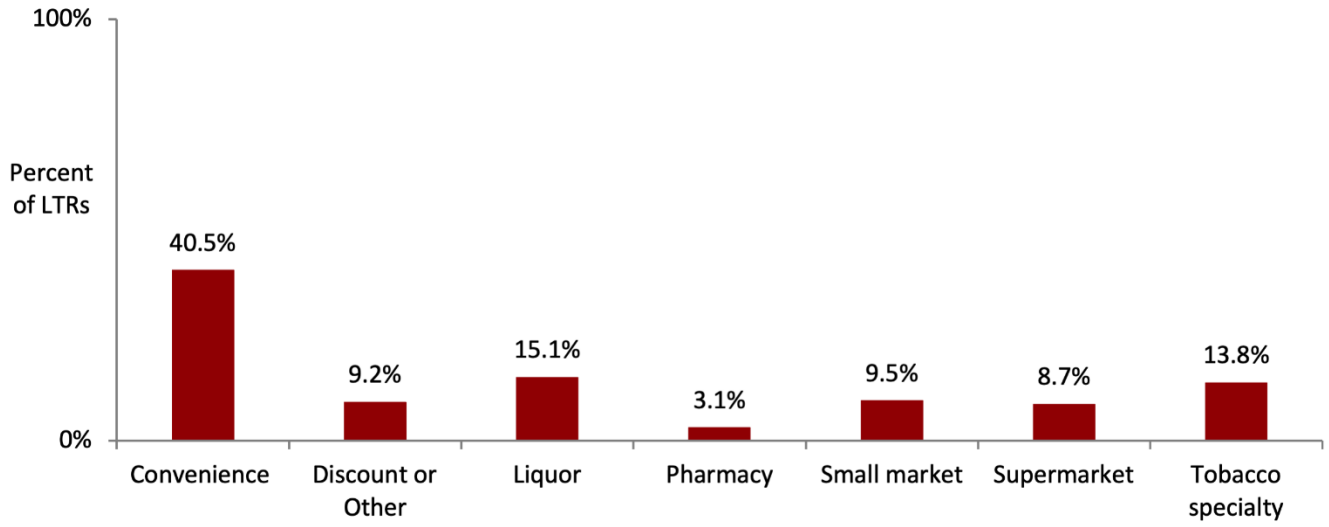
Of the 1,348 unique LTRs attempted, marketing surveillance was completed in 1,280 LTRs. The completion rate (number of completed surveys divided by the number of eligible LTRs) was 97.4 percent. Data collectors were rarely asked to leave stores (n=22). Other reasons for incomplete attempts were: LTR did not sell tobacco (n=14, ineligible), temporarily closed (n=12, ineligible), unsafe environment (n=7), permanently closed (n=6, ineligible), membership or fee required to enter (n=2, ineligible), or other (n=5). Figure 2 illustrates the location of the final sample relative to counties and two of the strata for over sampling.

Figure 2. CTRSS 2023 Sample ($n_{unweighted}$=1,280)



Applying weights, convenience stores represented the largest category of observed stores (40.5 percent), followed by liquor stores (15.1 percent), and tobacco specialty shops (13.8 percent) (see Figure 3). Pharmacies were the smallest category (3.1 percent), comprised almost entirely of Walgreens and Rite Aid, the last remaining tobacco-selling pharmacy chains in California.

Figure 3. Store type distribution in CTRSS 2023 (weighted percentages, $n_{weighted}$=29,457)



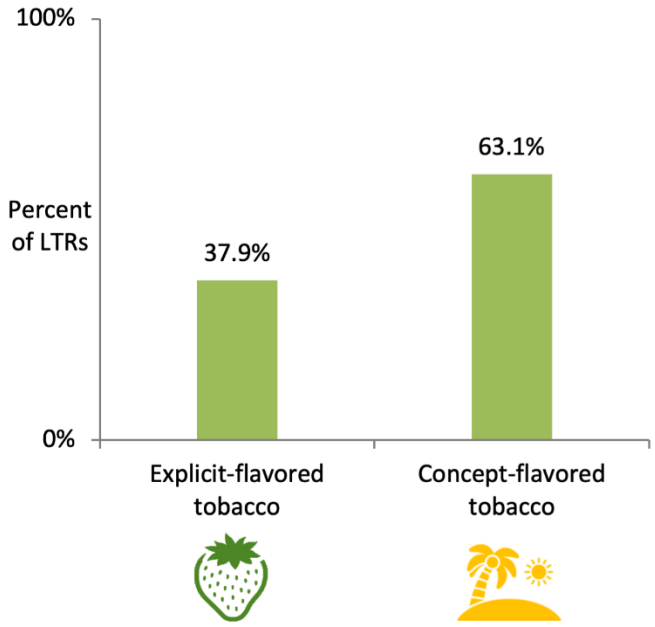
Cross-sectional analyses (2023)

The next five sections present descriptive statistics and mixed-model results summarizing the tobacco retail environment in 2023, seven to 11 months after SB 793 became effective. Models tested for relationships between measures of product visibility and advertising and store-neighborhood (census tract) demographics. With consideration of SB 793, measures included in the cross-sectional analysis were related to flavored tobacco products and products introduced into the retail environment as a possible response to SB 793.

Section 1. Visibility of any flavored tobacco by flavor category

After SB 793, explicit-flavored tobacco was visible in over one-third (37.9 percent) of LTRs and concept-flavored tobacco was visible in nearly two-thirds (63.1 percent) (see Figure 4).

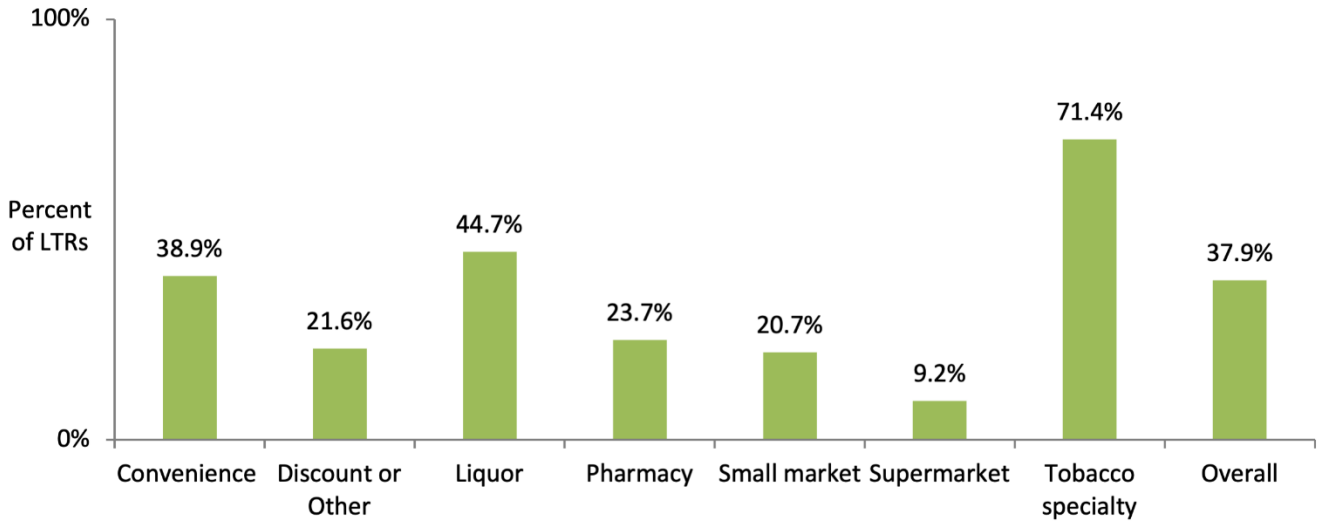
Figure 4. Any tobacco visibility by flavor (weighted percentages, $n_{weighted}$=29,457)



Note. Any explicit-flavored tobacco included chew/dip/snus, cigarillos, menthol cigarettes, nicotine pouches, and/or nicotine vape products. Any concept-flavored tobacco included cigarillos and/or nicotine vape products.

Explicit-flavored tobacco was visible in the vast majority of tobacco specialty shops (71.4 percent), followed by liquor stores (44.7 percent), and in more than one-third of convenience stores (38.9 percent) (see Figure 5). Additionally, explicit-flavored tobacco was visible in more than 20 percent of all other store types except supermarkets (9.2 percent).

Figure 5. Any explicit-flavored tobacco visibility by store type (weighted percentages, $n_{weighted}$=29,457)



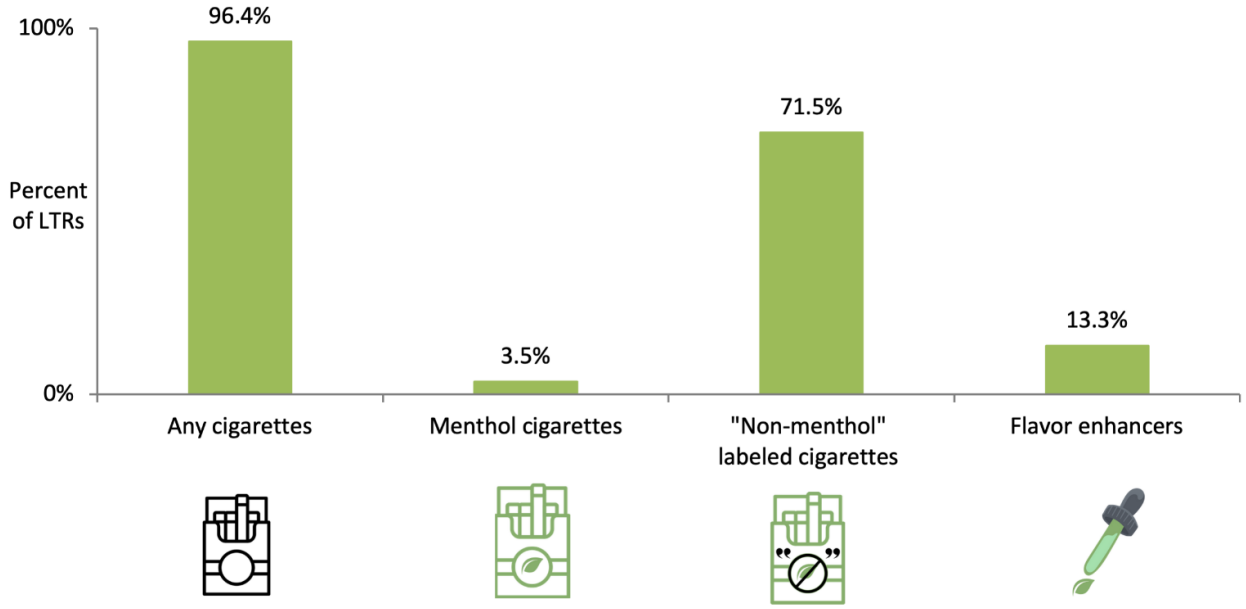
Note. Any explicit-flavored tobacco included chew/dip/snus, cigarillos, menthol cigarettes, nicotine pouches, and/or nicotine vape products.

Adjusting for clustering of LTRs within neighborhoods (census tracts), explicit-flavored tobacco was more likely to be visible in tobacco specialty shops (aOR=23.16, 95% CI=10.90, 49.17) than in convenience stores (see Table 2). However, explicit-flavored tobacco was less likely to be visible in small markets (aOR=0.06, 95% CI=0.02, 0.25), supermarkets (aOR=0.04, 95% CI=0.00, 0.43), and discount or other (aOR=0.12, 95% CI=0.03, 0.42) than in convenience stores. With concern for health equity, the odds of an LTR having explicit-flavored tobacco visible increased by 76 percent for each ten-percentage point increase in percent of non-Hispanic/Latino Black residents (aOR=1.76, 95% CI=1.28, 2.41) (see Table 2).

Section 2. Cigarette visibility and marketing

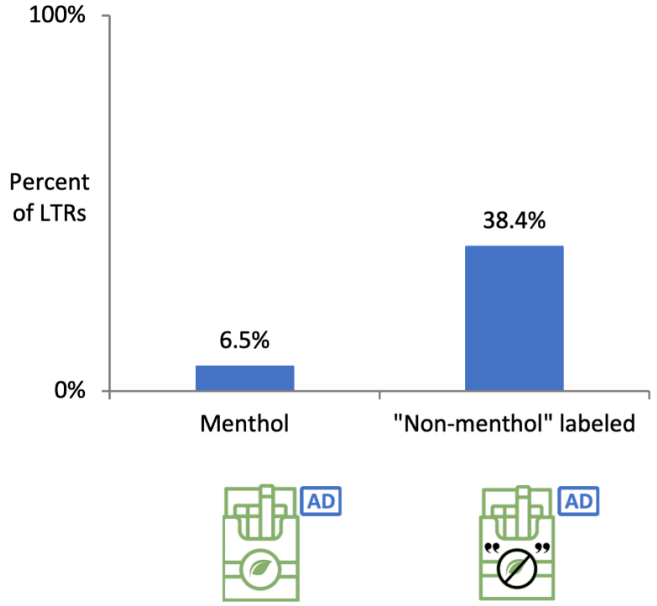
Menthol cigarettes were visible in only 3.5 percent of LTRs after SB 793 (see Figure 6). However, "non-menthol" labeled cigarettes were visible in 71.5 percent of LTRs, and flavor enhancers (e.g., flavor cards, flavors tubes, pellets) were visible in 13.3 percent of LTRs.

Figure 6. Cigarette visibility by flavor (weighted percentages, maximum $n_{weighted}$=29,362)



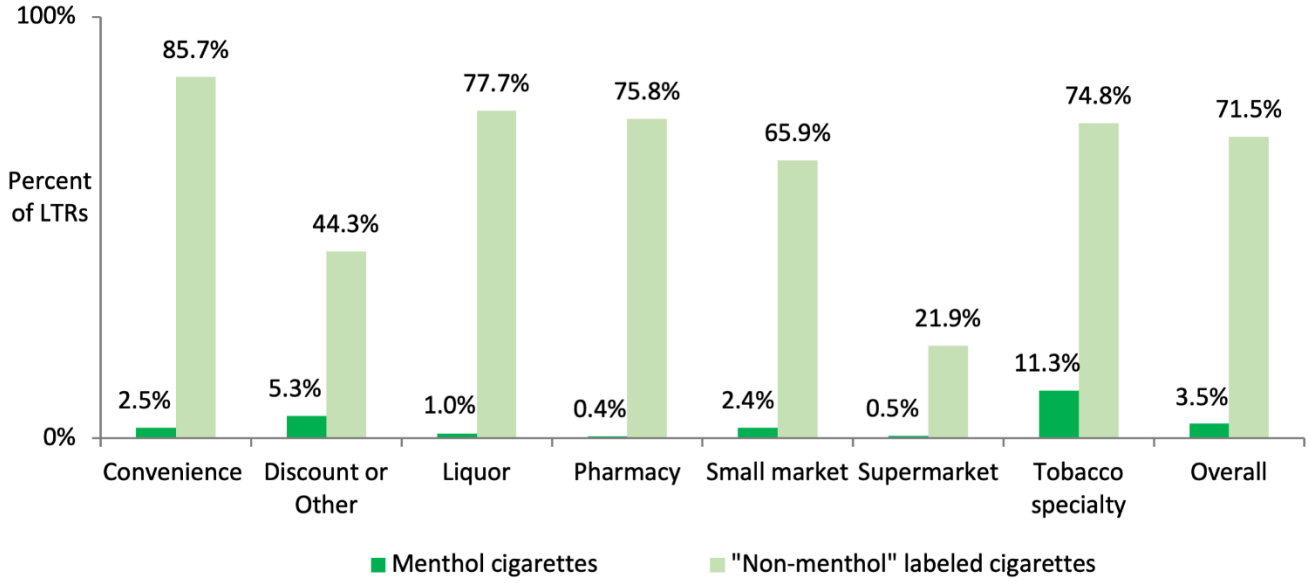
Advertisements for menthol cigarettes were observed in 6.5 percent of LTRs, and for "non-menthol" labeled cigarettes in 38.4 percent (see Figure 7). Discounts for "non-menthol" labeled cigarettes were observed in 28.1 percent of LTRs (data not shown).

Figure 7. Cigarette advertisements by product category (weighted percentages, max $n_{weighted}$=29,457)



After SB 793, menthol cigarettes were rarely visible for sale (in 3.5 percent of LTRs overall), but more so in tobacco specialty shops (11.3 percent) and discount or other stores (5.3 percent) (see Figure 8). Menthol cigarettes were rarely visible in convenience stores, liquor stores, pharmacies, small markets, and supermarkets (2.5 percent or less). However, "non-menthol" labeled cigarettes were visible in the vast majority of LTRs (71.5 percent), ranging from 85.7 percent in convenience stores to 21.9 percent in supermarkets.

Figure 8. Menthol and "non-menthol" labeled cigarette visibility by store type (weighted percentages, maximum $n_{weighted}$=29,218)

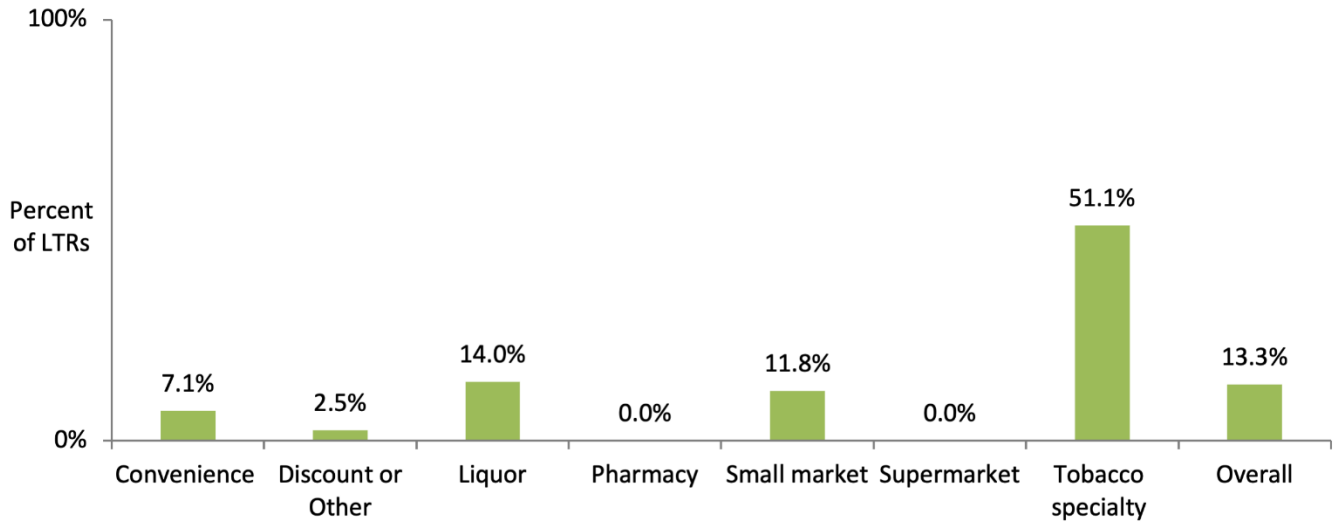


Adjusting for clustering of stores within neighborhoods, there was a positive relationship between the visibility of menthol cigarettes and percent of non-Hispanic/Latino Black residents. For each ten-percentage point increase in percent of non-Hispanic/Latino Black residents, the odds of a store having menthol cigarettes visible increased by 74 percent (aOR=1.74, 95% CI=1.25, 2.42) (see Table 2). However, as the percentage of Asian/Pacific Islander residents increased, the odds of menthol cigarettes being visible decreased (aOR=0.44, 95% CI=0.24, 0.82). No other relationships between menthol cigarette visibility and store-neighborhood demographics were identified. As with visibility of any explicit-flavored tobacco, the odds of menthol cigarettes being visible were more than 17 times greater in tobacco specialty shops than in convenience stores (aOR=17.65, 95% CI=6.66, 46.76).

Adjusting for clustering of LTRs within neighborhoods, there was a positive relationship between visibility of "non-menthol" labeled cigarettes and percent of Hispanic/Latino residents. For each ten-percentage point increase in percent of Hispanic/Latino residents, the odds of "non-menthol" labeled cigarettes being visible increased by 25 percent (aOR=1.25, 95% CI=1.01, 1.56). Compared to convenience stores, the odds of an LTR having visible "non-menthol" labeled cigarettes were lower in liquor stores (aOR=0.27, 95% CI=0.07, 0.99), small markets (aOR=0.04, 95% CI=0.01, 0.19), supermarkets (aOR=0.002, 95% CI=0.00, 0.01), and discount or other (aOR=0.02, 95% CI=0.004, 0.06), and tobacco specialty shops (aOR=0.17, 95% CI=0.08, 0.39) (see Table 2).

Flavor enhancers (e.g., flavor cards, tubes, and pellets) were visible in half of tobacco specialty shops (51.1 percent), which was a much greater presence than in liquor stores (14.0 percent) and small markets (11.8 percent) and other store types (see Figure 9). Flavor enhancers were not visible in pharmacies or supermarkets.

Figure 9. Flavor enhancer visibility by store type (weighted percentages, $n_{weighted}$=28,967)

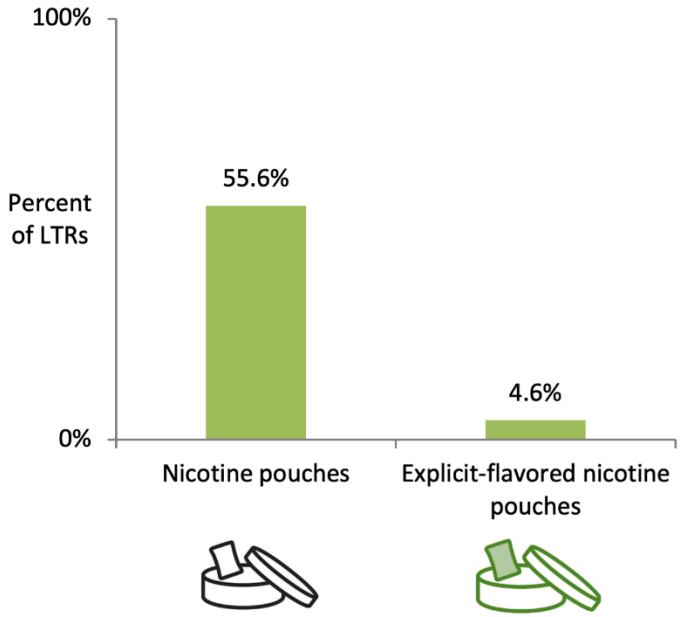


As with menthol cigarettes, the odds of visible flavor enhancers increased as the percent of non-Hispanic/Latino Black residents increased (aOR=1.40, 95% CI=1.03, 1.91) (see Table 2). For each ten-percentage point increase in percent of non-Hispanic/Latino Black residents, the odds of an LTR having flavor enhancers increased by 40 percent. Additionally, the odds of visible flavor enhancers were greater in tobacco specialty shops than convenience stores (aOR=156.04, 95% CI=62.95, 386.84). The adjusted model for flavor enhancers excluded pharmacies and supermarkets, where these products were not visible.

Section 3. Nicotine pouch visibility and marketing

After SB 793, nicotine pouches were visible in most LTRs (55.6 percent) but explicit-flavored nicotine pouches were only visible in 4.6 percent (Figure 10). Nicotine pouches were advertised in 36.8 percent of LTRs (data not shown).

Figure 10. Nicotine pouch visibility by flavor (weighted percentages, $n_{weighted}$=29,456)

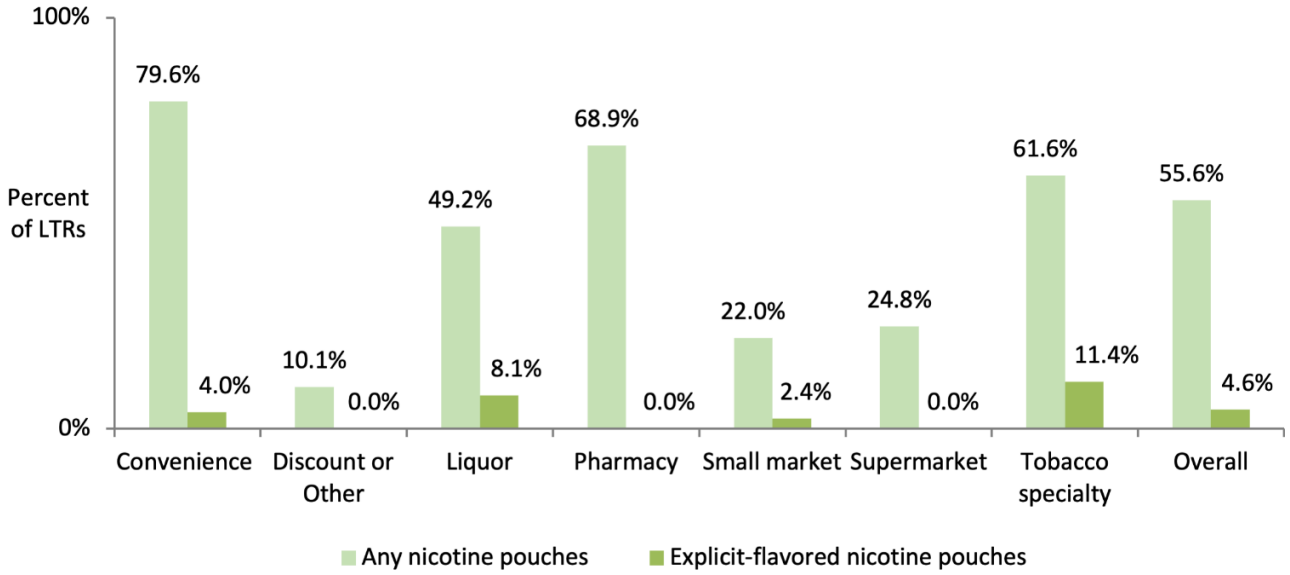


Regardless of flavor, nicotine pouches were most commonly visible in convenience stores (79.6 percent), followed by pharmacies (68.9 percent) and tobacco specialty shops (61.6 percent) (see Figure 11). However, this pattern differed for explicit-flavored nicotine pouches, which were most often visible in tobacco specialty shops (11.4 percent), followed by liquor stores (8.1 percent). Explicit-flavored nicotine pouches were not visible in any discount or other store type, pharmacy, or supermarket (see Figure 11).

Adjusting for clustering of LTRs within neighborhoods, the odds of visible nicotine pouches (regardless of flavor) were greater in convenience stores compared to all other store types (see Table 3). Additionally, as the percent of non-Hispanic/Latino Black or Hispanic/Latino residents increased, the odds of visible nicotine pouches decreased (aOR=0.64, 95% CI=0.49, 0.83; and aOR=0.75, 95% CI=0.62, 0.91). As the percent of residents in poverty increased, the odds of visible nicotine pouches also decreased (aOR=0.79, 95% CI=0.64, 0.98).

Visibility of explicit-flavored nicotine pouches after SB 793 was rare across all store types, except in tobacco specialty shops where prevalence was 11.4 percent. Model results are not reported due to low prevalence.

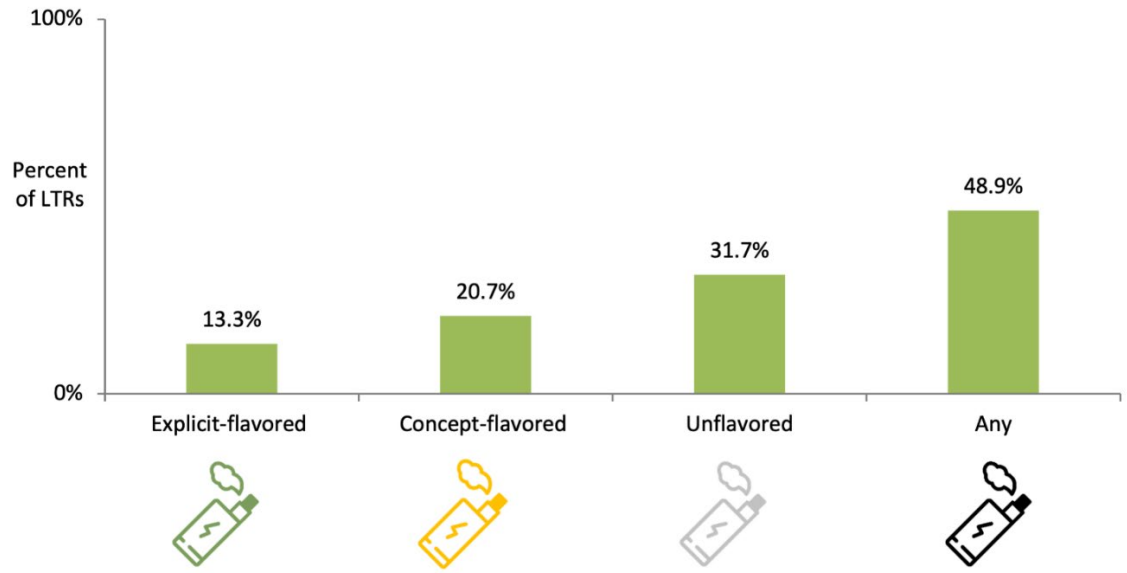
Figure 11. Nicotine pouch visibility by flavor and store type (weighted percentages, $n_{weighted}$=29,456)



Section 4. Nicotine vape product visibility and marketing

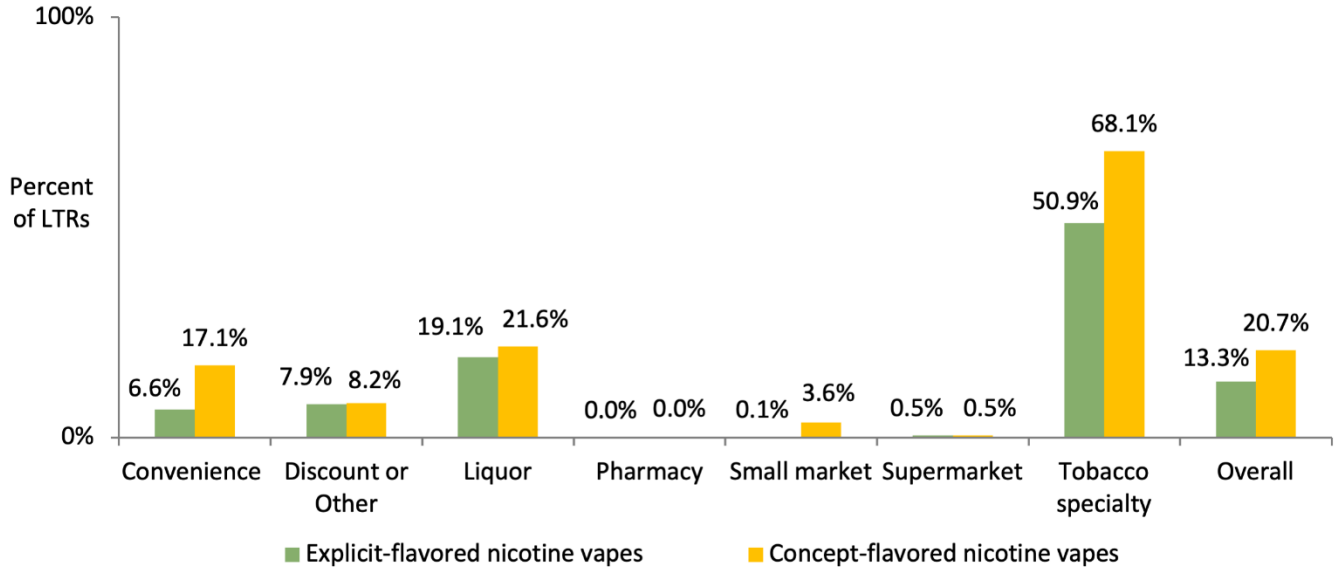
Following SB 793, explicit-flavored nicotine vapes were visible in 13.3 percent of LTRs, and concept-flavored nicotine vapes in 20.7 percent (see Figure 12). Just under half (48.9 percent) of LTRs had some type of nicotine vape product visible. Advertisements for explicit-flavored nicotine vapes were observed infrequently (2.6 percent of LTRs). Nicotine vapes that were marketed as unflavored were visible in nearly one-third (31.7 percent) of LTRs.

Figure 12. Nicotine vape visibility by flavor (weighted percentages, max $n_{weighted}$=29,526)



As shown in Figure 13, explicit-flavored and concept-flavored nicotine vape products were visible in the majority of tobacco specialty shops (50.9 and 68.1 percent, respectively). In liquor stores, explicit-flavored nicotine vapes were visible in 19.1 percent, and concept-flavored nicotine vapes in 21.6 percent. For convenience stores, explicit-flavored nicotine vapes were visible in 6.6 percent and concept-flavored nicotine vape products were observed in 17.1 percent. Neither explicit- nor concept-flavored nicotine vape products were visible in pharmacies.

Figure 13. Nicotine vape visibility by flavor and store type (weighted percentages, maximum $n_{weighted}$=28,905)

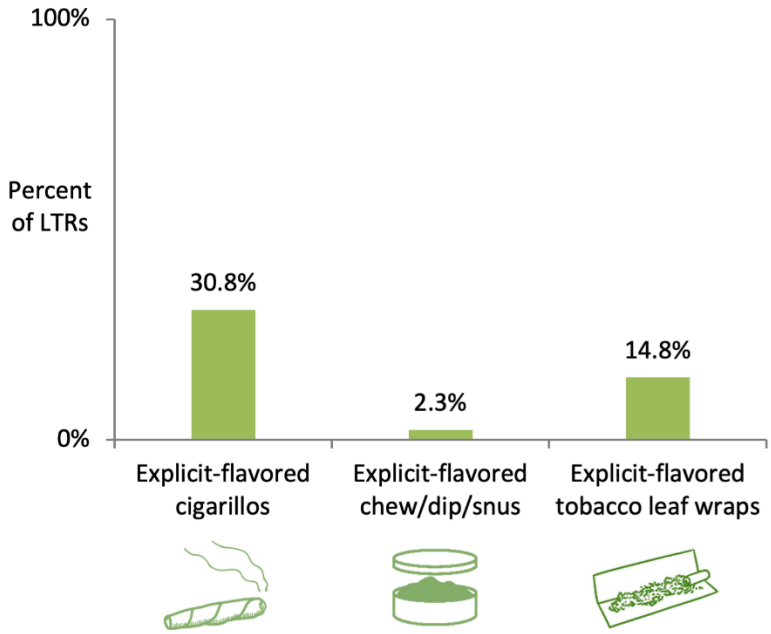


Adjusting for clustering of stores within neighborhoods, the odds of a liquor store or a tobacco specialty shop having visible explicit-flavored nicotine vape products were greater than for convenience stores (aOR=6.79, 95% CI=2.01, 22.90, aOR=171.67, 95% CI=70.53, 417.80). As the percent of non-Hispanic/Latino Black residents increased, the odds of explicit-flavored nicotine vapes being visible increased (aOR=1.47, 95% CI=1.09, 1.98). In addition, odds of explicit-flavored nicotine vapes being visible increased as the index of relative rurality increased (aOR=1.05, 95% CI=1.01, 1.09). Concept-flavored nicotine vapes were more likely to be visible in tobacco specialty shops (aOR=117.11, 95% CI=47.40, 289.34) than in convenience stores, but less likely to be visible in small markets (aOR=0.02, 95% CI=0.00, 0.19) and discount or other (aOR=0.15, 95% CI=0.03, 0.74) than in convenience stores. As the percent of non-Hispanic/Latino API residents in a store neighborhood increased, odds of visible concept-flavored nicotine vapes decreased (aOR=0.63, 95% CI=0.42, 0.96). Owing to low outcome prevalence, pharmacies, small markets and supermarkets were excluded from the model of visibility for explicit-flavored nicotine vapes, and pharmacies and supermarkets from the model of visibility for concept-flavored nicotine vapes.

Section 5. Cigar and other tobacco product visibility and marketing

After SB 793, cigarillos were visible in 79.6 percent of LTRs, however explicit-flavored cigarillos were visible in 30.8 percent of LTRs (see Figure 14), and advertised in 2.9 percent (data not shown). Just over half of LTRs (55.7 percent) had some type of chew/dip/snus visible, while explicit-flavored varieties were rarely visible (2.3 percent). Tobacco leaf wraps were visible in 47.0 percent of LTRs, and explicit-flavored varieties in 14.8 percent (see Figure 14).

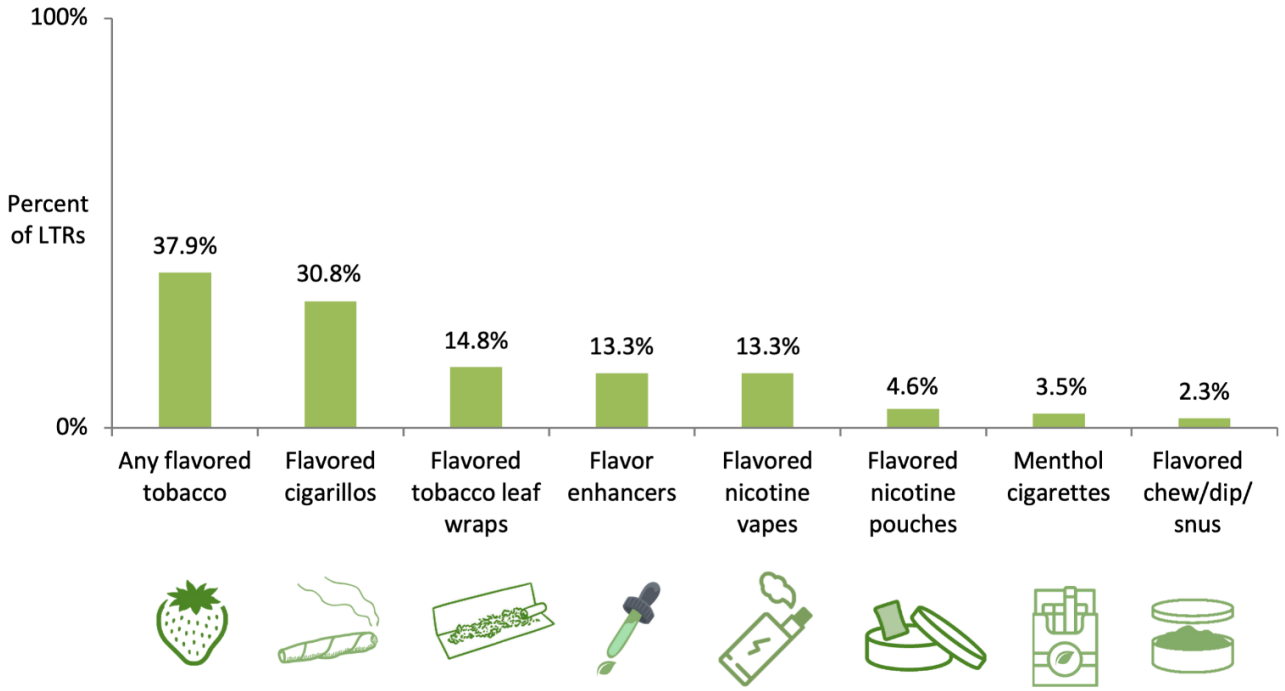
Figure 14. Explicit-flavored cigarillos and other tobacco product visibility (weighted percentages, maximum $n_{weighted}$=28,905)



Section 6. Summary of explicit-flavored tobacco

Explicit-flavored cigarillos were the most visible flavored tobacco product, seen in 30.8 percent of LTRs (see Figure 15). The next most common group of visible explicit-flavored tobacco products were explicit-flavored tobacco leaf wraps (14.8 percent), explicit-flavored nicotine vapes (13.3 percent), and flavor enhancers (13.3 percent). Explicit-flavored nicotine pouches, menthol cigarettes and explicit-flavored chew/dip/snus were visible in less than 5 percent of LTRs.

Figure 15. Visibility of explicit-flavored tobacco by product category (weighted percentages, maximum $n_{weighted}$=29,457)



Note. Flavored refers to explicit-flavored. Any flavored tobacco included chew/dip/snus, cigarillos, menthol cigarettes, nicotine pouches, and/or nicotine vape products.

Longitudinal analyses: A subset of same stores visited before and after SB 793

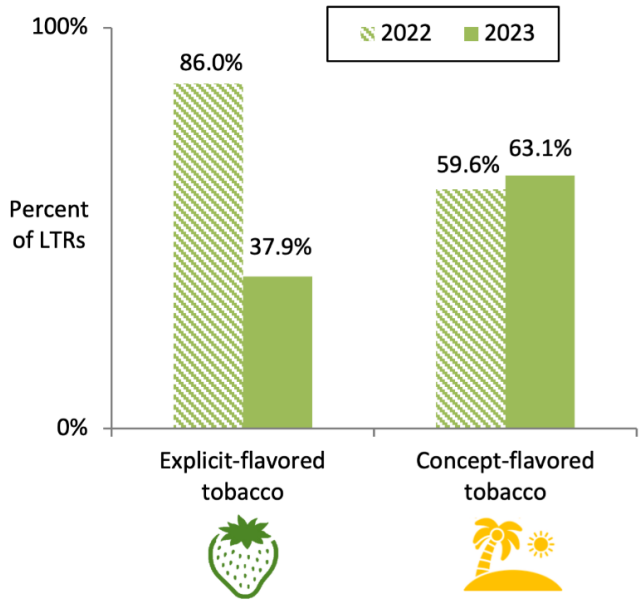
The next two sections address changes in flavored tobacco visibility and advertising by comparing observations in LTRs visited in 2022 (n=1,277) and those visited in 2023 (n=1,280), before and after SB 793 went into effect. Descriptive statistics for the visibility of explicit-flavored and concept-flavored tobacco products and advertising are reported for 2022 and 2023, applying weights computed for each year. The analysis of continued visibility in 2023 of five products visible in 2022 includes, for each measure, (1) computing descriptive statistics split by store type, and (2) models of area-level differences controlling for store type. Each model of continued visibility includes the subset of CTRSS 2023 stores where the product of interest (model outcome) was visible in 2022. Five models predict the continued visibility of: (1) any explicit-flavored tobacco, (2) menthol cigarettes, (3) any nicotine pouches, (4) explicit-flavored nicotine pouches, and (5) explicit-flavored nicotine vapes, as a function store type, store neighborhood demographics, and the index of relative rurality.

Section 7. Change in flavored tobacco visibility and marketing by year

Weighted descriptive statistics are presented by year (2022, 2023), for measures of flavored tobacco product and advertising visibility, using all LTRs with data for that year.

Before SB 793, visibility of explicit-flavored tobacco products was 86.0 percent, but decreased to 37.9 percent after SB 793 (see Figure 16). Visibility of concept-flavored tobacco increased slightly, from 59.6 percent to 63.1 percent.

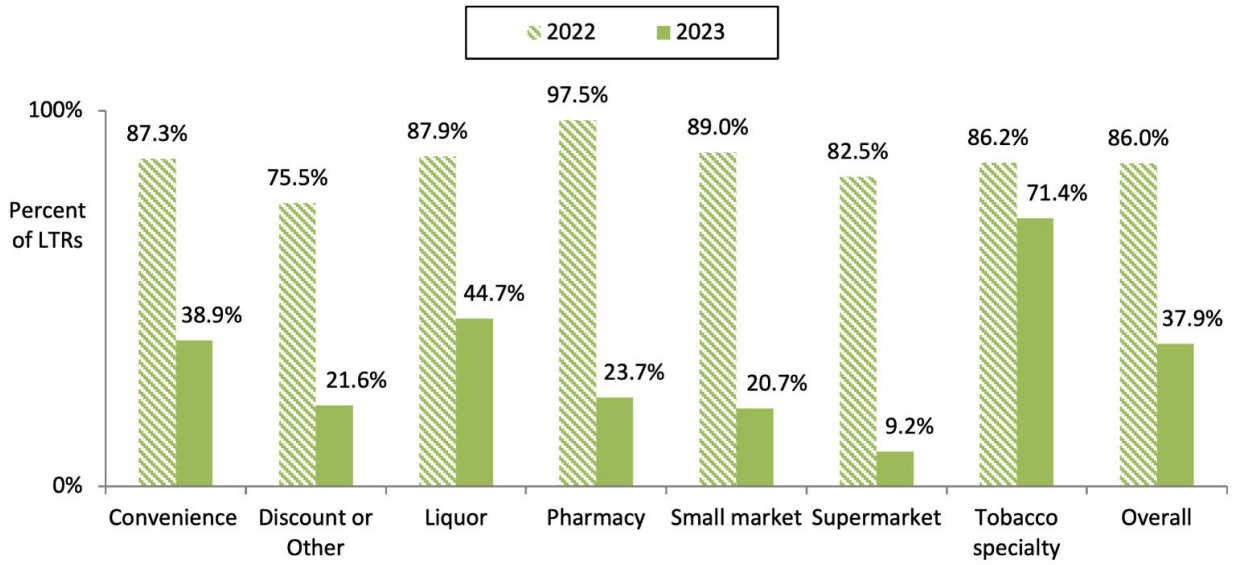
Figure 16. Change in visibility of any explicit- and concept-flavored tobacco (weighted percentages, maximum $n_{weighted}$=29,670)



Note. Any explicit-flavored tobacco included chew/dip/snus, cigarillos, menthol cigarettes, nicotine pouches, and/or nicotine vape products. Any concept-flavored tobacco included cigarillos and/or nicotine vape products.

After SB 793, the largest decreases in explicit-flavored tobacco visibility were observed in supermarkets and small markets (see Figure 17). However, the smallest decrease was observed in tobacco specialty shops, where explicit-flavored tobacco remained visible in 71.4 percent after SB 793.

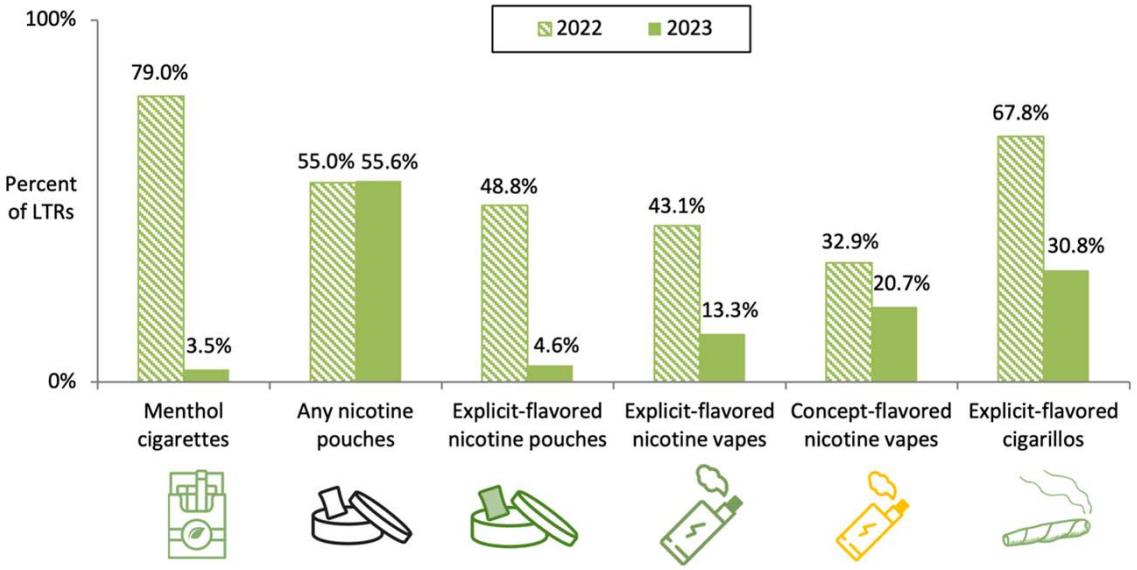
Figure 17. Any explicit-flavored tobacco visibility by store type and year (weighted percentages, maximum $n_{weighted}$=29,663)



Note. Any explicit-flavored tobacco included chew/dip/snus, cigarillos, menthol cigarettes, nicotine pouches, and/or nicotine vape products. Any concept-flavored tobacco included cigarillos and/or nicotine vape products.

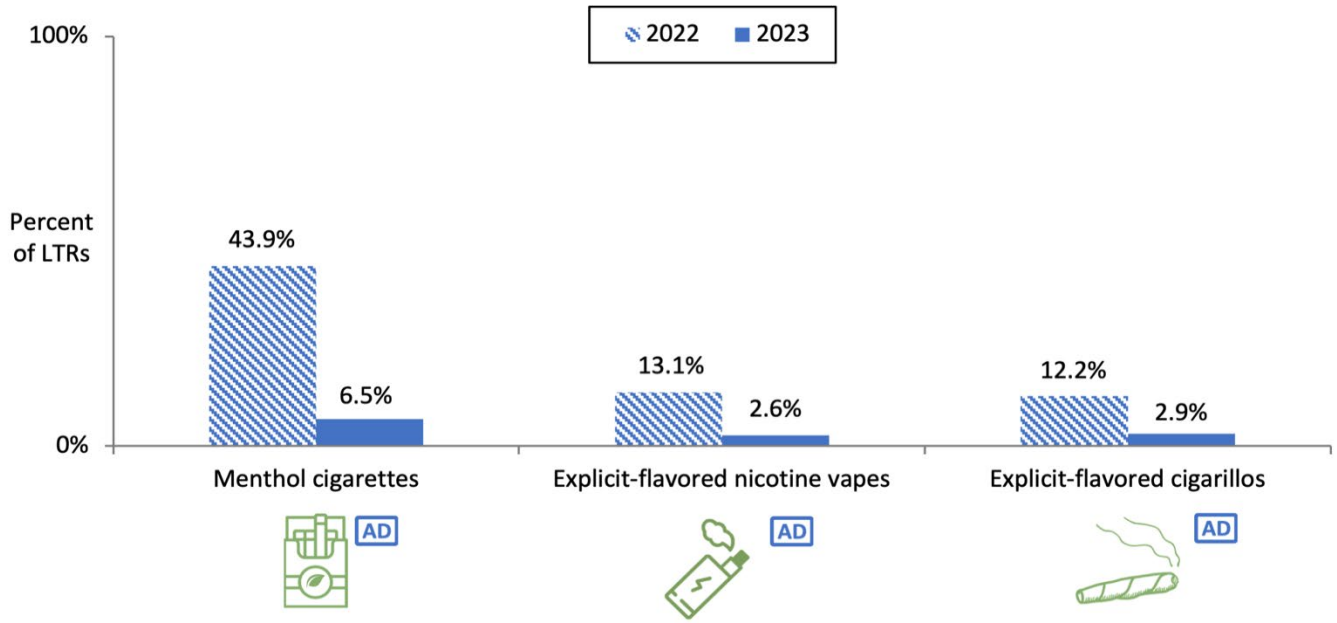
Visibility of menthol cigarettes decreased more than any other flavored product category, from 79.0 percent in 2022 to 3.5 percent in 2023 (see Figure 18). Similarly, visibility of explicit-flavored nicotine pouches was nearly eliminated, from 48.8 percent in 2022, to 4.6 percent in 2023. However, visibility of any nicotine pouches was stable over time in approximately half of LTRS, 55.0 percent in 2022 and 55.6 percent in 2023. Explicit-flavored nicotine vape products declined from 43.1 percent to 13.3 percent. Visibility of concept-flavored nicotine vape products declined from 32.9 percent to 20.7 percent. Visibility of explicit-flavored cigarillos declined from 68.8 percent in 2022 to 30.8 percent in 2023.

Figure 18. Change in visibility of flavored tobacco products and any nicotine pouches (weighted percentages, maximum $n_{weighted}$=28,905)



Visibility of any advertising for menthol cigarettes decreased from 43.9 percent in 2022 to 6.5 percent 2023 (see Figure 19). Advertising for explicit-flavored nicotine vape products also decreased, from 49.9 percent in 2022 to 2.6 percent in 2023. Advertising for explicit-flavored cigarillos was not common in 2022 (12.2 percent) and rarely visible in 2023 (2.9 percent).

Figure 19. Change in visibility of explicit-flavored tobacco product advertisements (weighted percentages, maximum $n_{weighted}$=28,905)

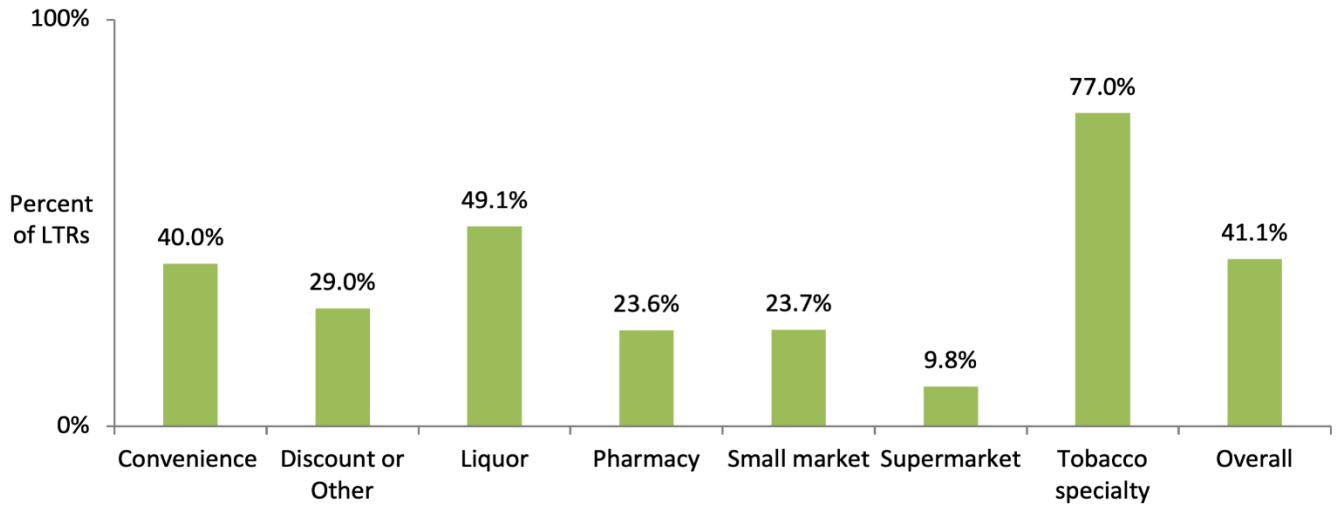


Section 8. Continued product visibility in 2023 among stores that sold product in 2022

Because continued visibility is a product-specific subgroup analysis, the number of LTRs varies by product category (unweighted minimum=601, unweighted maximum=1024). Therefore, the descriptive statistics for 2023 can differ slightly from those computed using the full 2023 sample.

Continued visibility of any explicit-flavored tobacco product. After SB 793, any visible explicit-flavored tobacco persisted in 41.1 percent of stores overall. Continued visibility was most common in tobacco specialty shops (77.0 percent), followed by 49.1 percent of liquor stores, 40.0 percent of convenience stores, and approximately 24 percent of small markets and pharmacies (see Figure 20).

Figure 20. Continued visibility of any explicit-flavored tobacco in 2023 among subgroup of LTRs that sold product in 2022, by store type (weighted percentages, $n_{weighted}$=24,887)

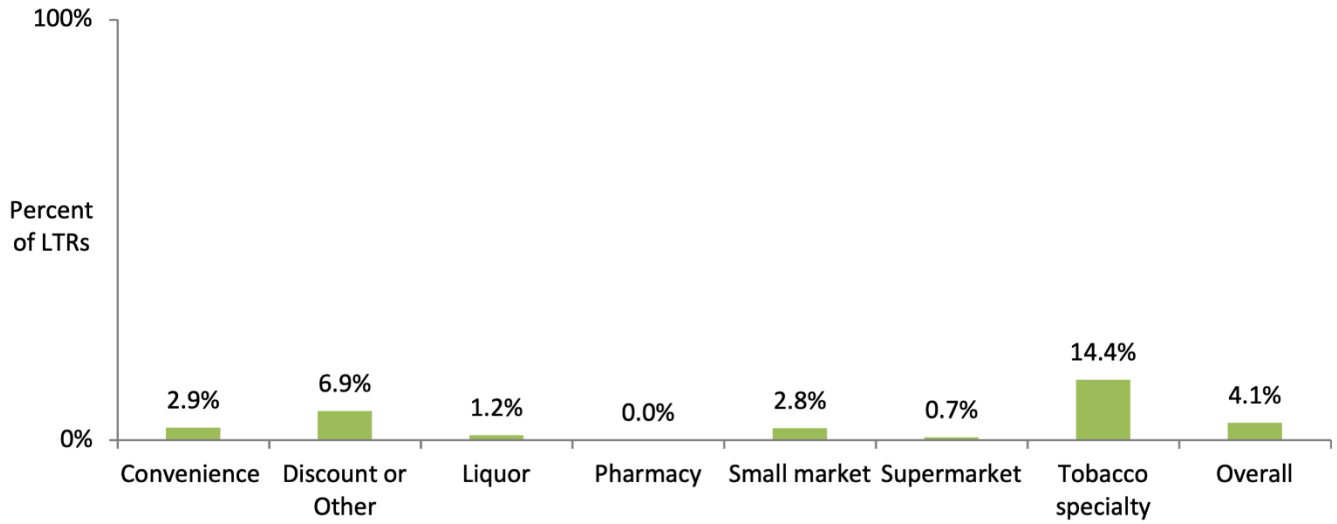


Note. Any explicit-flavored tobacco included chew/dip/snus, cigarillos, menthol cigarettes, nicotine pouches, and/or nicotine vape products. Any concept-flavored tobacco included cigarillos and/or nicotine vape products.

Adjusting for clustering of LTRs within neighborhoods, the odds of continued visibility of explicit-flavored tobacco were significantly lower in discount or other store types, pharmacies, small markets, and supermarkets than convenience stores (aORs≤0.10) (see Table 4). However, the odds of continued visibility were significantly greater in tobacco specialty shops compared to convenience stores (aOR=50.36, 95% CI=12.22, 139.16). Additionally, the odds of continued visibility of explicit-flavored tobacco increased as the percent of non-Hispanic/Latino Black residents in a store neighborhood increased (aOR=1.96, 95% CI=1.27, 3.02).

Menthol cigarettes. After SB 793, continued visibility of menthol cigarettes was observed in 4.1 percent of LTRs overall. Notably, menthol cigarettes remained visible in tobacco specialty shops (14.4 percent) at twice the rate of all other store types (see Figure 21). No pharmacies had continued visibility of menthol cigarettes after SB 793.

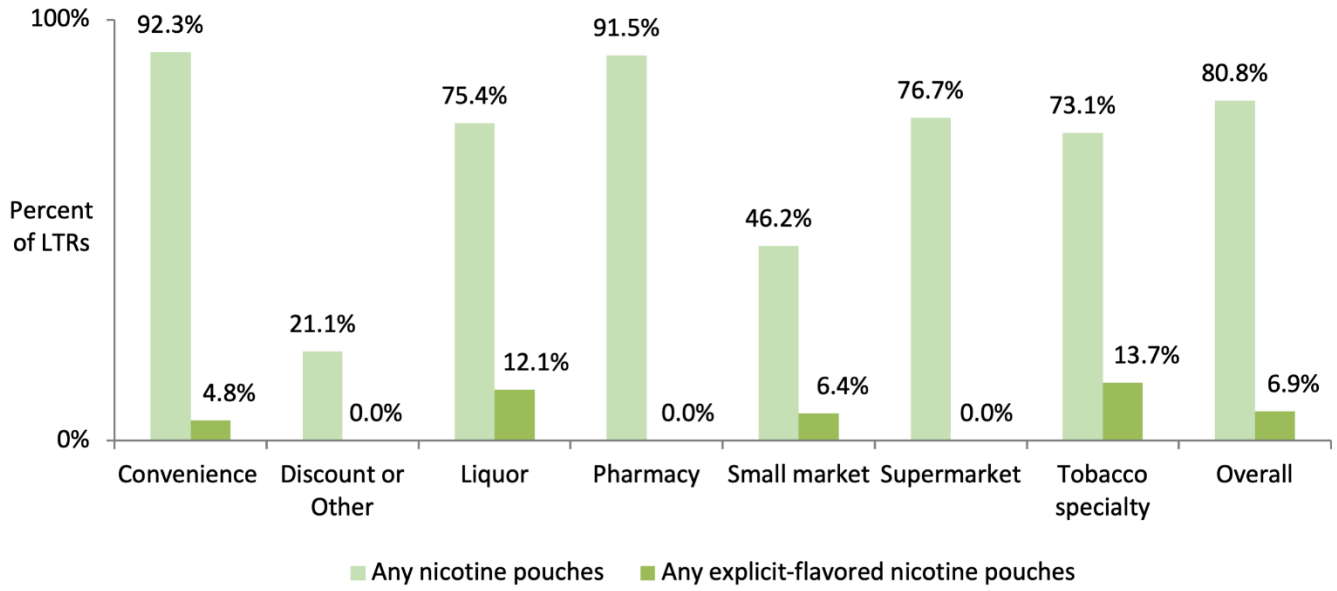
Figure 21. Continued visibility of menthol cigarettes in 2023 among subgroup of LTRs that sold product in 2022, by store type (weighted percentages, $n_{weighted}$=22,576)



The model of continued visibility of menthol cigarettes by store type compared tobacco specialty shops to all other store types combined, due to the high prevalence of continued visibility in tobacco specialty shops relative to all other store types, as well as small cell sizes for some store types. Adjusting for clustering of stores within neighborhoods, continued visibility of menthol cigarettes was significantly more common in tobacco specialty shops than all other store types combined (aOR=58.57, 95% CI=15.65, 219.14). Continued visibility of menthol was also significantly more common at stores in neighborhoods with a higher percent of non-Hispanic/Latino Black residents (see Table 4). Specifically, a 10 percentage-point increase in percent of non-Hispanic/Latino Black residents in a store neighborhood was associated with a 60 percent increase in the odds of continued visibility of menthol cigarettes (aOR=1.60, 95% CI=1.03, 2.49). The predicted odds of continued visibility of menthol cigarettes were lower as the percent of non-Hispanic/Latino API residents increased (aOR=0.24, 95% CI=0.08, 0.75) (see Table 4).

Continued visibility of any nicotine pouches and explicit-flavored nicotine pouches. After SB 793, any nicotine pouches continued to be visible in 80.8 percent of LTRs that displayed them in 2022. However, only 6.9 percent of LTRs with visible explicit-flavored nicotine pouches in 2022 continued to display these products in 2023 (see Figure 22). Continued visibility of explicit-flavored nicotine pouches was most common in tobacco specialty stores (13.7 percent) and liquor stores (12.1 percent). While almost all convenience stores (92.3 percent) and pharmacies (91.5 percent) continued to display any nicotine pouches, after SB 793 very few convenience stores (4.8 percent) and no pharmacies continued to display explicit-flavored nicotine pouches.

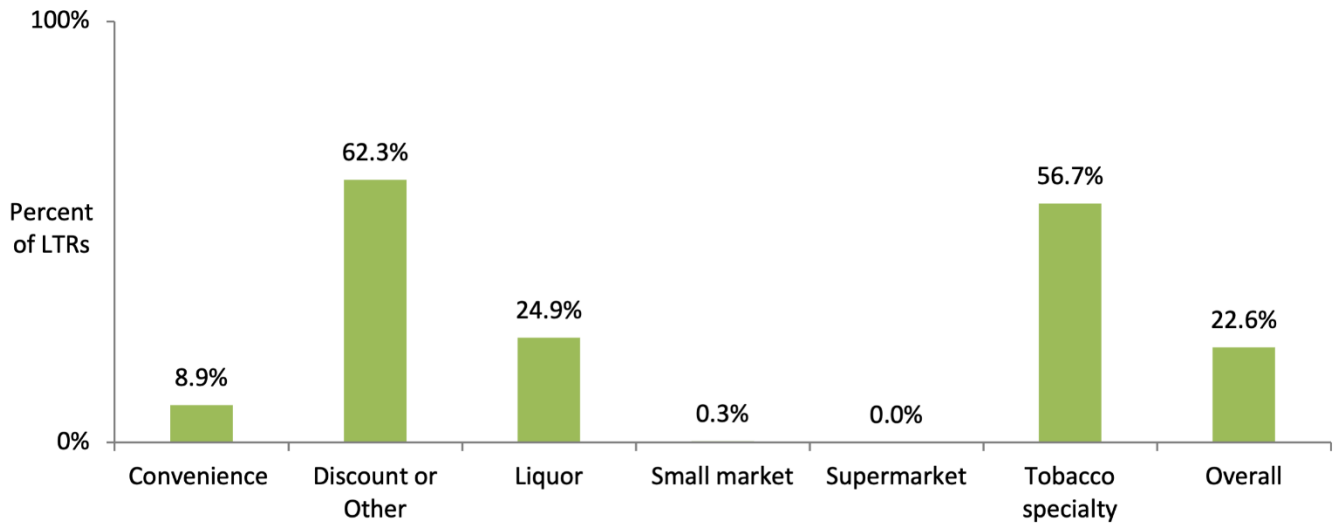
Figure 22. Continued visibility of any and explicit-flavored nicotine pouches in 2023 among subgroup of LTRs that sold product in 2022, by store type (weighted percentages, $n_{weighted}$=16,037)



Compared to convenience stores, the odds of continued visibility of any nicotine pouches were lower in all other store types (aORs≤ 0.11) except pharmacies (see Table 5). The odds of continued visibility of any nicotine pouches decreased as the percent of non-Hispanic/Latino API residents increased (aOR=0.48, 95% CI=0.24, 0.95), and as the percent of Hispanic/Latino residents increased (aOR=0.65, 95% CI=0.44, 0.96). Similarly, odds of continued visibility of any nicotine pouches decreased as the percent of residents living in poverty increased (aOR=0.50, 95% CI=0.33, 0.76). For the model of continued visibility of explicit-flavored nicotine pouches, store type was coded as tobacco specialty shops, liquor stores, or all other store types combined (reference category), due to low prevalence and small cell sizes. The odds of continued visibility of explicit-flavored nicotine pouches were higher in tobacco specialty shops compared to all other store types (except liquor stores) (aOR=16.25, 95% CI=3.46, 76.34). The model did not identify significant relationships between continued visibility of explicit-flavored nicotine pouches and store-neighborhood demographics.

Continued visibility of explicit-flavored nicotine vapes. In 2023, explicit-flavored nicotine vapes remained visible in the majority of tobacco specialty shops in which the product was visible in 2022 (56.7 percent) (see Figure 23). One in four liquor stores (24.9 percent) continued to have visible explicit-flavored nicotine vapes, compared to 8.9 percent of convenience stores. It is noteworthy that no supermarket had continued visibility of explicit-flavored nicotine vape products. There were only seven stores in the discount or other store type category with explicit-flavored nicotine vapes visible in 2022 that had data for CTRSS 2023. Thus, the estimate of 62.3 percent continued visibility of explicit-flavored nicotine vapes for this store type should not be generalized statewide.

Figure 23. Continued visibility of explicit-flavored nicotine vapes in 2023 among subgroup of LTRs that sold product in 2022, by store type (weighted percentages, $n_{weighted}$=14,495)



Owing to low prevalence or small cell sizes, the adjusted model of continued visibility of explicit-flavored nicotine vapes compared tobacco specialty shops and liquor stores to all other store types combined. Adjusting for clustering of stores within neighborhoods, odds of continued visibility of explicit-flavored nicotine vapes were greater in tobacco specialty shops (aOR=220.56, 95% CI=66.65, 730.04) and liquor stores (aOR=10.59, 95% CI=2.15, 52.27) compared to all other store types combined (see Table 5). As the index of relative rurality increased, the odds of continued visibility of explicit-flavored nicotine vapes increased (aOR=1.06, 95% CI=1.01, 1.12). Sensitivity analyses exploring models specified without weights, or excluding store types with small cell size or low prevalence, consistently identified greater odds of visibility in tobacco specialty shops and liquor stores. However, the magnitude of the relationships and estimated odds ratios varied with differing model specifications, and should be interpreted with caution.

CONCLUSIONS AND RECOMMENDATIONS

Key findings from this report indicate that compliance with SB 793 varies by store type, product category, and store-neighborhood demographics. According to an observational survey in a representative sample of 1,280 LTRs (weighted n=29,457) that was conducted seven to 11 months after SB 793, explicit-flavored tobacco was visible in 37.9 percent of LTRs overall, but more so in tobacco specialty shops (71.4 percent) than other store types. This result is concerning given place-based differences in the location of tobacco specialty shops and their record of poor compliance.[9–12] Explicit-flavored tobacco was also visible in nearly half of liquor stores (44.7 percent), 38.9 percent of convenience stores, and pharmacies (22.0 percent), but less so in small markets (17.1 percent), discount or other stores (11.1 percent), and supermarkets (2.5 percent).

Product category. Retail compliance with SB 793 also varied by product category. Menthol cigarettes were nearly invisible in the tobacco retail environment in 2023, observed in only 3.5 percent of LTRs. However, "non-menthol" labeled cigarettes that contain a cooling agent were visible in 71.5 percent of stores. Although explicit-flavored cigarillos were visible in 30.8 percent of LTRs, this estimate should be interpreted with caution due to low IRR. When multiple data collectors coded the same stores, they disagreed about the visibility of explicit-flavored cigarillos, meaning the measure had poor reliability. Explicit-flavored nicotine vapes and explicit-flavored cigarillos had the highest product-specific rates of visibility (13.1 percent, and 30.8 percent) and represent the main product categories of concern.

Nicotine pouches were visible in more than half of observed LTRs (55.6 percent), although explicit-flavored varieties were rarely visible (4.6 percent). Among all store types, nicotine pouches had the highest rate of visibility in convenience stores (79.6 percent); however, explicit-flavored varieties had the highest rate of visibility in tobacco specialty shops (11.4 percent). The odds of nicotine pouches being visible in LTRs were lower in neighborhoods with a greater proportion of residents who were non-Hispanic/Latino Black or Hispanic/Latino.

After SB 793, nicotine vapes were visible in approximately half (48.9 percent) of all LTRs, but explicit-flavored nicotine vapes were less common. These products were visible in 13.3 percent of LTRs, and advertised in 2.6 percent. However, concept-flavored nicotine vapes (20.7 percent) and vapes marketed as unflavored (31.7 percent) were more visible. Again, there was a positive relationship between the odds of explicit-flavored nicotine vape visibility and store neighborhood percent of non-Hispanic/Latino Black residents. Both explicit- and concept-flavored nicotine vapes had the highest rates of visibility in tobacco specialty shops (50.9 percent and 68.1 percent, respectively), with liquor stores being the next most common venue with visible explicit-flavored (19.1 percent) and concept-flavored (21.6 percent) nicotine vapes. In convenience stores, concept-flavored nicotine vapes were visible more often (17.1 percent) than explicit-flavored nicotine vapes (6.6 percent). It is noteworthy that explicit-flavored nicotine vapes were virtually invisible in pharmacies, small markets, and supermarkets (less than 0.5 percent).

Explicit-flavored varieties of cigarillos were visible in nearly one-third of LTRs (30.8 percent). Far less common were explicit-flavored varieties of chew/dip/snus (2.3 percent) and tobacco leaf wraps (14.8 percent).

For the first time, CTRSS 2023 assessed the visibility of "non-menthol" labeled cigarettes that contain a cooling agent, finding these products were visible in a majority (71.5 percent) of LTRs, especially in convenience stores (85.7 percent), liquor stores (77.7 percent), and pharmacies (75.8 percent). In addition, the odds that these products were visible in LTRs were higher in neighborhoods with a greater proportion of residents who were Hispanic/Latino, which raises further concerns for health equity. Assembly Bill (AB) 3218, effective January 1, 2025, expanded the definition of characterizing flavors to include products that impart a cooling sensation, which could eliminate the visibility and sales of "non-menthol" labeled cigarettes.[6,13]

Also new to CTRSS 2023 was the assessment of flavor enhancers, which were visible in 13.3 percent of observed LTRs even though their sales are prohibited by law. Flavor enhancers were visible in half (51.4 percent) of tobacco specialty shops, in far fewer convenience stores (7.1 percent), but not in any pharmacies or supermarkets. In October 2023, less than one month before the end of data collection, the California Attorney General issued Notices of Determination for NKD and OCB branded flavor enhancers.[14,15] These notices alerted manufacturers that their products were reviewed and determined to be flavored. Thus, we would anticipate lower rates of visibility of these products in future retail surveillance.

AB 3218 will also require manufacturers to submit a list of all tobacco products that are eligible for sale in California to the State Attorney General and to certify that each brand style lacks a characterizing flavor, by December 31, 2025.[16] Indeed, recent research underscores the need to clarify for California retailers which tobacco products can and cannot be sold.[17]

Store-neighborhood demographics. While overall visibility of explicit-flavored tobacco was relatively low, area-level differences in visibility raise concerns for health equity. For example, the odds of any explicit-flavored tobacco being visible were higher in LTRs located in neighborhoods with a greater proportion of non-Hispanic/Latino Black residents. More specifically, the odds of a convenience store having explicit-flavored tobacco visible were 76 percent higher in a neighborhood with 25 percent of the residents non-Hispanic/Latino Black than in a neighborhood with 15 percent of the residents non-Hispanic/Latino Black. Similarly, the odds of a convenience store having menthol cigarettes visible were 74 percent higher in a neighborhood with 25 percent of residents non-Hispanic/Latino Black than in a neighborhood with 15 percent non-Hispanic/Latino Black residents. The same change in odds would apply to a difference in neighborhood residents non-Hispanic/Latino Black of 5 percent versus 15 percent, or 18 percent versus 28 percent. For every product category that was modeled (any explicit-flavored tobacco, menthol cigarettes, explicit-flavored nicotine vape products, and flavor enhancers), the odds of explicit-flavored tobacco being visible were higher in LTRs located in neighborhoods with a greater percent of non-Hispanic/Latino Black residents. However, no relationships were identified

between the visibility of “non-menthol” labeled cigarettes or concept-flavored nicotine vape products, and percent of non-Hispanic/Latino Black residents.

As with any explicit-flavored tobacco and menthol cigarettes, there were significantly higher odds that flavor enhancers were visible in neighborhoods with a greater proportion of non-Hispanic/Latino Black residents. This implies that the marketing of these products targets a population burdened with the highest rates of smoking menthol cigarettes.

Marketing. SB 793 restricts sales of flavored tobacco but not advertising. Even so, only 6.5 percent of LTRs advertised menthol cigarettes. However, 38.4 percent advertised the “non-menthol” labeled cigarettes that were marketed as replacement products for people who used menthol. Advertising of explicit-flavored vapes and explicit-flavored cigarillos was rare. While explicit-flavored nicotine vapes were visible in 13.3 percent of LTRs, advertising for these products was present in only 2.6 percent of LTRs. A similar pattern was observed for explicit-flavored cigarillos, with product visible in 30.8 percent of stores, but advertising present in only 2.9 percent.

Longitudinal sample. For the first time, this report assessed continued visibility of explicit-flavored tobacco using data from a longitudinal sample of LTRs. From 2022 to 2023, visibility of any explicit-flavored tobacco decreased from 86.0 percent to 37.9 percent. In addition, visibility of concept-flavored tobacco increased only slightly, from 59.6 percent to 63.1 percent, and was not driven by any one particular product category. Among LTRs identified in CTRSS 2022 as having explicit-flavored tobacco visible, tobacco specialty stores were most likely to have continued visibility of flavored tobacco in 2023 (77.0 percent). Nearly half (49.1 percent) of liquor stores had continued visibility of explicit-flavored tobacco as did 40.0 percent of convenience stores. Continued visibility of explicit-flavored products was greater in tobacco specialty shops than all other store types. The odds of continued visibility of any explicit-flavored tobacco and menthol cigarettes were higher for LTRs in neighborhoods with a greater percent of non-Hispanic/Latino Black residents. However, the odds of continued visibility of any nicotine pouches were lower in LTRs in neighborhoods with a lower percent of non-Hispanic/Latino API and Hispanic/Latino residents.

Strengths and limitations. This report provides a snapshot of flavored tobacco visibility before and after SB 793 using: (1) cross-sectional observations from 2023 in a large representative sample (unweighted n=1,280, and weighted n=29,457) and (2) longitudinal observations using data from the full CTRSS 2022 sample (unweighted n=1,277) and the 2023 sample (unweighted n=1,280), before and after SB 793, and (3) the subset of LTRs with data for both time points (unweighted n=1,137) to examine continued visibility of flavored tobacco. The major strengths of the CTRSS sample are generalizability and the opportunity to assess change over time in the same LTRs with minimal loss to attrition (unweighted n=140). The state’s list of LTRs that was used as the sampling frame represents a single time point, and does not reflect time-varying changes in location and types of LTRs, which can detract from generalizability. Another limitation pertains to items with lower reliability. As the value of an IRR statistic decreases, the likelihood of a Type II error (failing to detect statistically significant relationships) in hypothesis tests increases. Thus, results for tests of measures with lower IRR values

should be interpreted with caution. It is also important bear in mind that CTRSS measures product visibility, which may underestimate the prevalence of flavored tobacco products in retail environment if some LTRs sell flavored tobacco products that are hidden from view.

Highlights

- After SB 793, visibility of explicit-flavored tobacco products decreased from 86.0 percent of LTRs in 2022 to 37.9 percent in 2023.
- Contrary to expectation, SB 793 was not associated with a large increase in visibility of concept-flavored tobacco products with ambiguous flavor names, increasing from 59.6 to 63.1 percent.
- Menthol cigarettes were nearly invisible in California's tobacco retail environment in 2023, decreasing from 79.0 percent of LTRs in 2022 to 3.5 percent in 2023.
- The tobacco industry replaced menthol cigarettes (visible in only 3.5 percent of LTRs) with "non-menthol"-labeled look-alikes, many of which contained synthetic cooling agents (visible in 71.5 percent of LTRs). These products have since been legally defined as flavored and in violation of SB 793.
- "Non-menthol" labeled cigarettes had the highest rates of visibility in convenience stores (85.7 percent), liquor stores (77.7 percent), and pharmacies (75.8 percent).
- Store types with the greatest visibility of explicit-flavored tobacco products were tobacco specialty shops, where most (71.4 percent) had explicit-flavored tobacco products displayed, and liquor stores where nearly half (44.7 percent) had explicit-flavored tobacco products displayed.
- In 2023, explicit-flavored tobacco products and flavor enhancers were more likely to be visible at LTRs in neighborhoods with a greater percent of non-Hispanic/Latino Black residents, which raises concern for health equity.

Recommendations

- Tobacco specialty shops and liquor stores should be prioritized for enforcement of SB 793, given significantly higher rates of visible flavored tobacco.
- Equitable implementation strategies for SB 793 should ensure neighborhoods with a higher percent of populations that are traditionally targeted by the tobacco industry experience the benefit of the law, particularly given significantly higher rates of visible explicit-flavored tobacco products in non-Hispanic/Latino Black residents.
- Regarding explicit-flavored tobacco, enforcement activities should consider prioritizing cigarillos and vapes, the two product categories with the highest rates of visibility in 2023.
- Mandating tobacco-free pharmacies would reduce a retail source with very high visibility of "non-menthol" labeled cigarettes and any nicotine pouches.
- Given that AB 3218 expanded the definition of a "characterizing flavor" to include products with a cooling sensation, future retail surveillance should test for a decrease in visibility of "non-menthol" labeled cigarettes.
- Future retail surveillance should also test for a decrease in the visibility of flavor enhancers, given the California Attorney General's notifications to manufacturers that their products are flavored.

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TABLES

Table 2. Mixed models of visibility in 2023 of any explicit-flavored tobacco ($n_{unweighted}$=1,279), menthol cigarettes ($n_{unweighted}$=1,129), "non-menthol" labeled cigarettes ($n_{unweighted}$=1,273), and flavor enhancers ($n_{unweighted}$=1,122)

	Any explicit-flavored tobacco	**Menthol cigarettes**	**"Non-menthol" labeled cigarettes**	**Flavor enhancers**
Model Term	**aOR (95% CI)**	**aOR (95% CI)**	**aOR (95% CI)**	**aOR (95% CI)**
Store type				
Convenience (reference)				
Discount or other	**0.12** (0.03, 0.42)	3.46 (0.61, 19.73)	**0.02** (0.00, 0.06)	0.10 (0.01, 1.26)
Liquor	2.21 (0.77, 6.34)	0.57 (0.10, 3.15)	**0.27** (0.07, 1.00)	2.07 (0.56,7.64)
Pharmacy	0.22 (0.04, 1.25)	Not included in model	0.24 (0.05, 1.23)	Not included in model
Small market	**0.06** (0.02, 0.25)	0.61 (0.04, 9.81)	**0.04** (0.01, 0.19)	1.81 (0.37, 8.74)
Supermarket	**0.04** (0.00, 0.43)	Not included in model	**0.002** (0.00, 0.01)	Not included in model
Tobacco specialty	**23.16** (10.91, 49.17)	**17.65** (6.66, 46.76)	**0.17** (0.08, 0.39)	**156.04** (62.95, 386.84)
Neighborhood characteristics				
% NHL Black	**1.76** (1.28, 2.41)	**1.74** (1.25, 2.42)	1.30 (0.92, 1.85)	**1.40** (1.03, 1.91)
% NHL API	0.86 (0.62, 1.20)	**0.44** (0.24, 0.82)	1.01 (0.72, 1.42)	0.82 (0.58, 1.17)
% Hispanic/Latino	1.04 (0.84, 1.29)	1.26 (0.95, 1.67)	**1.25** (1.01, 1.55)	1.26 (1.00, 1.60)
% NHL Other race	0.60 (0.21, 1.77)	1.48 (0.27, 8.20)	1.49 (0.48, 4.62)	1.47 (0.47, 4.62)
% Under 21 years	1.54 (0.94, 2.50)	1.52 (0.67, 3.46)	1.03 (0.62, 1.70)	1.19 (0.69, 2.06)
% ≤200% FPL	1.04 (0.81, 1.34)	0.77 (0.53, 1.11)	1.18 (0.92, 1.51)	1.00 (0.76, 1.33)
Index of relative rurality	0.98 (0.94, 1.01)	1.03 (0.98, 1.09)	0.98 (0.95, 1.02)	0.99 (0.94, 1.04)

Note. Store neighborhoods are census tracts; aOR=Adjusted odds ratio; **Bolded** aORs are significant at p<0.05; 95% CI=95 percent Confidence Interval; NHL=non-Hispanic/Latino; API=Asian/Pacific Islander, % NHL Other=percent of population who identified as non-Hispanic/Latino American Indian, Alaskan Native, multiple races, or other (combined); FPL=Federal Poverty Level; % ≤200% FPL refers to percent of population with household income less than 200 percent of the federal poverty level. Estimates for intercept not shown.

Table 3. Mixed models of visibility in 2023 of nicotine pouches ($n_{unweighted}$=1,279), explicit-flavored nicotine vapes ($n_{unweighted}$=1,037), and concept-flavored nicotine vapes ($n_{unweighted}$=1,118)

	Nicotine pouches	**Explicit-flavored nicotine vapes**	**Concept-flavored nicotine vapes**
Model term	**aOR (95% CI)**	**aOR (95% CI)**	**aOR (95% CI)**
Store type			
Convenience (reference)			
Discount or other	**0.001** (0.0002, 0.007)	0.58 (0.11, 3.04)	**0.15** (0.03, 0.74)
Liquor	**0.07** (0.02, 0.19)	**6.79** (2.01, 22.90)	1.71 (0.57, 5.17)
Pharmacy	**0.17** (0.04, 0.83)	Not included in model	Not included in model
Small market	**0.002** (0.00, 0.01)	Not included in model	**0.02** (0.00, 0.19)
Supermarket	**0.009** (0.00, 0.04)	Not included in model	Not included in model
Tobacco specialty	**0.20** (0.09, 0.41)	**171.67** (70.53, 417.80)	**117.11** (47.40, 289.34)
Neighborhood characteristics			
% NHL Black	**0.64** (0.49, 0.83)	**1.47** (1.09, 1.98)	1.08 (0.80, 1.48**)**
% NHL API	1.01 (0.73, 1.38)	0.97 (0.62, 1.52)	**0.63** (0.42, 0.96)
% Hispanic/Latino	**0.75** (0.62, 0.91)	1.22 (0.98, 1.51)	0.89 (0.73, 1.10)
% NHL Other race	1.73 (0.63, 4.71)	0.37 (0.12, 1.21)	1.69 (0.62, 4.66)
% Under 21 years	1.49 (0.94, 2.34)	0.83 (0.51, 1.35)	0.95 (0.58, 1.54)
% ≤200% FPL	**0.79** (0.64, 0.98)	0.96 (0.75, 1.24)	1.10 (0.85, 1.43)
Index of relative rurality	1.03 (1.00, 1.07)	**1.05** (1.01, 1.09)	1.01 (0.97, 1.04)

Note. Store neighborhoods are census tracts; AOR=Adjusted odds ratio; **Bolded** aORs are significant at p<0.05; 95% CI=95 percent Confidence Interval; NHL=non-Hispanic/Latino; API=Asian/Pacific Islander, % NHL Other=percent of population who identified as non-Hispanic/Latino American Indian, Alaskan Native, multiple races, or other (combined); FPL=Federal Poverty Level; % ≤200% FPL refers to percent of population with household income less than 200 percent of the federal poverty level. Estimates for intercept not shown.

Table 4. Multilevel models of continued visibility of any explicit-flavored tobacco ($n_{unweighted}$=1,024), and menthol cigarettes ($n_{unweighted}$=914)

	Any explicit-flavored tobacco	**Menthol cigarettes**
Model Term	**aOR (95% CI)**	**aOR (95% CI)**
Store type		
Convenience	Ref	Ref
Discount or other	**0.07** (0.01, 0.39)	Ref
Liquor	3.01 (0.88, 10.24)	Ref
Pharmacy	**0.10** (0.01, 0.89)	Ref
Small market	**0.06** (0.01, 0.36)	Ref
Supermarket	**0.005** (0.00, 0.03)	Ref
Tobacco specialty	**50.36** (12.22, 139.16)	**58.57** (15.65, 219.14)
Neighborhood characteristics		
% NHL Black	**1.96** (1.27, 3.02)	**1.60** (1.03, 2.49)
% NHL Asian/Pacific Islander	0.98 (0.62, 1.54)	**0.24** (0.08, 0.75)
% Hispanic/Latino	1.14 (0.89, 1.48)	1.41 (0.93, 2.14)
% NHL Other race	0.40 (0.11, 1.45)	2.87 (0.26, 31.36)
% Under 21 years	1.01 (0.56, 1.83)	1.94 (0.54, 6.91)
% ≤200% federal poverty level	0.91 (0.67, 1.25)	0.66 (0.38, 1.17)
Index of relative rurality	0.98 (0.94, 1.02)	1.01 (0.95, 1.08)

Note. Store neighborhoods are census tracts; aOR=Adjusted odds ratio; **Bolded** aORs are significant at p<0.05; 95% CI=95 percent Confidence Interval; Reference categories vary by model, some models collapse multiple store types; NHL=non-Hispanic/Latino; % NHL Other=percent of population who identified as non-Hispanic/Latino American Indian, Alaskan Native, multiple races, or other (combined); % ≤200% federal poverty level refers to percent of population with household income less than 200 percent of the federal poverty level.

Table 5. Multilevel models of continued visibility of nicotine pouches ($n_{unweighted}$=678), explicit-flavored nicotine pouches ($n_{unweighted}$=621), and explicit-flavored nicotine vapes ($n_{unweighted}$=632)

	Nicotine pouches	**Explicit-flavored nicotine pouches**	**Explicit-flavored nicotine vapes**
Model Term	**aOR (95% CI)**	**aOR (95% CI)**	**aOR (95% CI)**
Store type			
Convenience	Ref	Ref	Ref
Discount or other	**0.00002** (0.00, 0.001)	Ref	Ref
Liquor	**0.04** (0.01, 0.33)	7.25 (0.74, 70.87)	**10.59** (2.15, 52.27)
Pharmacy	1.06 (0.04, 29.43)	Ref	Ref
Small market	**0.003** (0.00, 0.04)	Ref	Ref
Supermarket	**0.03** (0.00, 0.92)	Ref	Ref
Tobacco specialty	**0.11** (0.03, 0.39)	**16.25** (3.46, 76.34)	**220.57** (66.65, 730.04)
Neighborhood characteristics			
% NHL Black	0.93 (0.45, 1.92)	1.09 (0.53, 2.25)	1.37 (0.90, 2.10)
% NHL Asian/Pacific Islander	**0.48** (0.24, 0.95)	0.71 (0.30, 1.66)	0.98 (0.43, 2.21)
% Hispanic/Latino	**0.65** (0.44, 0.96)	1.40 (0.84, 2.33)	1.25 (0.91, 1.71)
% NHL Other race	0.65 (0.10, 4.18)	2.58 (0.25, 26.08)	0.23 (0.05, 1.17)
% Under 21 years	1.21 (0.52, 2.80)	0.35 (0.12, 1.03)	0.71 (0.35, 1.43)
% ≤200% federal poverty level	**0.50** (0.33, 0.76)	0.59 (0.29, 1.18)	0.96 (0.69, 1.35)
Index of relative rurality	1.03 (0.97, 1.10)	0.96 (0.88, 1.04)	**1.06** (1.01, 1.12)

Note. Store neighborhoods are census tracts; aOR=Adjusted odds ratio; **Bolded** aORs are significant at p<0.05; 95% CI=95 percent Confidence Interval; Reference categories vary by model, some models collapse multiple store types; NHL=non-Hispanic/Latino; % NHL Other=percent of population who identified as non-Hispanic/Latino American Indian, Alaskan Native, multiple races, or other (combined); % ≤200% federal poverty level refers to percent of population with household income less than 200 percent of the federal poverty level. Estimates for intercept not shown.

Appendix I. INTER-RATER RELIABILITY STATISTICS AND SUMMARY OF INCLUDED ANALYSES

	2023	2023	2023	2022-2023	2022-2023
	Inter-rater reliability (n=136)	Cross-sectional results (n=1,280)	Cross-sectional results by store type and models (n=1,280)	Longitudinal results: Change from 2022 (n=1,277) to 2023 (n=1,280)	Continued visibility of flavored tobacco: Results by store type and models (n=1,137)
Any flavored tobacco					
Any explicit-flavored tobacco	.66	X	X	X	X
Any concept-flavored tobacco	.49	X		X	
Cigarettes					
Any cigarettes	N/A*	X			
Menthol cigarettes	.78	X	X	X	X
"Non-menthol" labeled cigarettes	.79	X	X	X	
Flavor enhancers	.58	X	X		
Menthol cigarette advertisements	.74	X		X	
"Non-menthol" labeled cigarette advertisements	.58	X			
"Non-menthol" labeled cigarette discounts	.59	X			
Nicotine pouches					
Any nicotine pouches	.65	X	X	X	X
Explicit-flavored nicotine pouches	.70	X	X	X	X
Nicotine pouch advertisements	.75	X			
Nicotine vape products					
Any nicotine vapes	.84	X			
Explicit-flavored nicotine vapes	.72	X	X	X	X
Concept-flavored nicotine vapes	.71	X	X	X	
Nicotine vapes marketed as unflavored	.61	X			
Explicit-flavored nicotine vape advertisements	.91	X		X	
Cigarillos, chew/dip/snus, and tobacco leaf wraps					
Any cigarillos	.64	X		X	
Explicit-flavored cigarillos	.48	X		X	
Explicit-flavored cigarillo advertisements	.79	X		X	
Any chew/dip/snus	.58	X			
Explicit-flavored chew/dip/snus	.78	X			
Any tobacco leaf wraps	.51	X			
Explicit-flavored tobacco leaf wraps	.48	X			
Little filtered cigars	.37				

Note. Measures with IRR kappa statistics greater than or equal to 0.50 were eligible for modeling, measures with IRR statistics between 0.40 and 0.49 were eligible for descriptive statistics but were not modelled, and measures with IRR statistics less than 0.40 were ineligible for reporting and further analysis. n values are unweighted, and represent the maximum sample size. *Statistic not computed owing to high prevalence, 96.4%.

Appendix II. CTRSS 2023 SURVEILLENCE INSTRUMENT

California Tobacco Retail Surveillance 2023

Paper Instrument, Final version 5.0

Q1 CTRSS 2023 (Version 5.0)

Q2 Store ID (6- or 8-digit ID)

_____

Q3 Please re-enter Store ID (6- or 8-digit ID)

_____

Q4 Coder ID (2-character ID)

_____

Q5 What is the store name?

_____

Q6 Does the actual store address match the assigned address? *If no, enter address of store you **will** survey.*

- ○ Yes (1)
- ○ No (0) _____

Q7 Will you attempt to survey this store? (Select one)

- ○ Yes (1)
- ○ No (0)

Skip To: Q106 If Attempt survey No (If Q7 = 0)

Q8 What type of store? (Select one)

- ○ Convenience (with or without gas) (1)
- ○ Small market/produce market (sells raw meat) (2)
- ○ Liquor store (3)
- ○ Supermarket/large grocery store (4)
- ○ Discount stores (e.g., Dollar General, 98 Cent Store, Walmart) (5)
- ○ Pharmacy (6)
- ○ Tobacco specialty (vape/smoke/head shop/hookah) (7)
- ○ Other (e.g., hotel gift shop, gas kiosk) (8)

Q9 Which products are sold? (Must be in stock)
Note: Shelf tags do not count as being sold. Ignore product not yet on shelves.

	Yes (1)	No (0)	Can't determine (2)
Any **cigarettes** (Q9_1)	○	○	○
Any **cigarillos** (Q9_2)	○	○	○
Any **nicotine vape products** (Q9_3)	○	○	○

Q10 Little filtered cigars

Q11 **Little filtered cigars** sold? (e.g., Djarum Special, Djarum Black, Talon, Swisher Sweets)

- ○ Yes (1)
- ○ No (0)
- ○ Can't determine (2)

Display This Question: If Little filtered cigars sold = Yes (Q11 = 1)
Q12 **Explicit flavors** of little filtered cigars sold? (e.g., fruit/candy, menthol/mint, alcohol)

- ○ Yes (1)
- ○ No (0)
- ○ Can't determine (2)

Q13 Tobacco leaf wrap

Q14 **Tobacco leaf** wraps sold? (Cigar wraps or blunt wraps) (e.g., Zig Zag, Loose Leaf, Al Capone)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Tob leaf wraps sold = Yes (Q14 = 1)

Q15 **Explicit flavors** of tobacco leaf wraps sold? (e.g., fruit/candy, menthol/mint, alcohol)

- Yes (1)
- No (0)
- Can't determine (2)

Q16 Non-tobacco wraps

Q17 **Non-tobacco** wraps sold? (e.g., Zagz, Banana Blunt, King Palm, High Hemp)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Non-tob wraps sold = Yes (Q17 = 1)

Q18 **Explicit flavors** of non-tobacco wraps sold? (e.g., fruit/candy, menthol/mint, alcohol)

- Yes (1)
- No (0)
- Can't determine (2)

Q19 Chew, dip, or snus

Q20 **Chew, dip, or snus** sold? (e.g., Copenhagen, Grizzly, Camel Snus)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Chew/dip/snus: Sold = Yes (Q20 = 1)

Q21 **Explicit flavors** of chew, dip, or snus sold? (e.g., wintergreen, menthol/mint, peach)

- Yes (1)
- No (0)
- Can't determine (2)

Q22 ZYN nicotine pouches

Q23 **ZYN nicotine pouches** sold?

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question:

If Nic pouch: ZYN sold = No (Q23 = 0)

Or Nic pouch: ZYN sold = Can't determine (Q23 = 2)

Q24 Other brands of nicotine pouches

Display This Question:

If Nic pouch: ZYN sold = No (Q23 = 0)

Or Nic pouch: ZYN sold = Can't determine (Q23 = 2)

Q25 **Other brands** of **nicotine pouches** sold? (e.g., Velo, on!, Rogue)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question:

If Nic pouch: ZYN sold = Yes (Q23 = 1)

Or Nic pouch: Other sold = Yes (Q25 = 1)

Q26 **Explicit flavors** of nicotine pouches sold? (e.g., spearmint, fruit/candy, coffee)

- Yes (1)
- No (0)
- Can't determine (2)

Q27 Nicotine pouches **advertised** inside store? (e.g., Zyn, Velo, on!)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any cigarettes = [Yes] (Q9_1 = 1)

Q28 **The following items are about CIGARETTES**

Display This Question: If Products sold: = Any cigarettes = [Yes] (Q9_1 = 1)

Q29 New **"non-menthol"** cigarettes

Display This Question: If Products sold: = Any cigarettes = [Yes] (Q9_1 = 1)

Q30 New **"non-menthol"** cigarettes sold? (e.g., Newport "non-menthol," Newport EXP, Camel Crush/Crisp, Kool)
Note: *Look for "**non-menthol**" on pack; **ignore red** packs*

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any cigarettes = [Yes] (Q9_1 = 1)

Q31 **Menthol** cigarettes

Display This Question: If Products sold: = Any cigarettes = [Yes] (Q9_1 = 1)

Q32 **Menthol** cigarettes sold? (e.g., Newport menthol, Camel Crush menthol, Marlboro Menthol)

- Yes (1)
- No (0)
- Can't determine (2)

Q33 Any cigarettes **advertised** inside store?

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any cigs: Int ad = Yes (Q33 = 1)

Q34 New **"non-menthol"** cigarettes **advertised** inside store? (e.g., Newport "non-menthol," Newport EXP, Camel Crush/Crisp, Kool)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any cigs: Int ad = Yes (Q33 = 1)

Q35 **Menthol** cigarettes **advertised** inside store? (e.g., Newport menthol, Camel Crush menthol, Marlboro Menthol)

- Yes (1)
- No (0)
- Can't determine (2)

Q36 Any cigarettes **discounted** inside store?

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any cigs: Int dis = Yes (Q36 = 1)

Q37 New **"non-menthol"** cigarettes **discounted** inside store? (e.g., Newport "non-menthol," Newport EXP, Camel Crush/Crisp, Kool)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any cigarillos [Yes] (Q9_2 = 1)

Q38 The following items are about **CIGARILLOS**

Display This Question: If Products sold: = Any cigarillos [Yes] (Q9_2 = 1)

Q39 **Explicit flavors** of cigarillos sold? (e.g., fruit/candy, menthol/mint, alcohol)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any cigarillos [Yes] (Q9_2 =1)

Q40 **Concept flavor** cigarillos sold? (e.g., jazz, wild rush, blue, arctic ice)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any cigarillos [Yes] (Q9_2 =1)

Q41 **Smallest** pack size of cigarillos?

- 1, sold as singles (1)
- 2 to 4 (2)
- 5 to 9 (3)
- 10 to 19 (4)
- 20 or more (5)
- Can't determine (6)

Display This Question: If Products sold: = Any cigarillos [Yes] (Q9_2 =1)

Q42 Price of the **cheapest pack** of cigarillos?

- $0.99 or less (1)
- $1.00 – $1.99 (2)
- $2.00 – $2.99 (3)
- $3.00 – $3.99 (4)
- $4.00 – $4.99 (5)
- $5.00 or more (6)
- Can't determine (7)

Q43 Any cigarillos **advertised** inside store? (e.g., Swisher Sweet, Black & Mild, Backwoods, White Owl)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any cigarillo: Int ad = Yes (Q43 = 1)

Q44 **Explicit flavors** of cigarillos **advertised** inside store? (e.g., fruit/candy, menthol/mint, alcohol)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q45 The following items are about **NICOTINE VAPE PRODUCTS**

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q46 Nicotine vape **pods or cartridges** sold? (e.g., JUUL, Vuse, Blu, NJOY)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q47 Disposable nicotine vape products

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q48 **Disposable** nicotine vape products sold? (e.g., Puff Bar, blu, NJOY, Flum)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Disp vape: Sold = Yes (Q48 = 1)

Q49 High volume disposable nicotine vape products (5000 or 6000 puffs)

Display This Question: If Disp vape: Sold = Yes (Q48 = 1)

Q50 **High volume** disposable nicotine vape products (5000 or 6000 puffs) sold? (e.g., ELFBAR wide form factor, Hyppe Max Air)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q51 Nicotine e-liquids

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q52 **Nicotine e-liquids** sold?

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q53 The following questions apply to **ANY** nicotine vape products (e.g., disposable, pod/cartridge refill, or e-liquid):

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q54 "**Unflavored**" nicotine vape products sold? (e.g., clear, naked, flavorless)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q55 **Explicit flavors** of nicotine vape products sold? (e.g., fruit/candy, menthol/mint, alcohol)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Products sold: = Any nicotine vape products [Yes] (Q9_3 =1)

Q56 Concept flavor nicotine vape products sold? (e.g., meteor, neon dream, citra zing, arctic, unicorn tears)

- Yes (1)
- No (0)
- Can't determine (2)

Q57 **The next items are about NICOTINE VAPE PRODUCT ADVERTISING AND DISCOUNTS**
Any nicotine vape products advertised inside store?

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any nic vape: Int ad = Yes (Q57 = 1)

Q58 **Explicit flavors** of nicotine vape products **advertised** in store? (e.g., fruit/candy, mint/menthol, alcohol, banana ice)

- Yes (1)
- No (0)
- Can't determine (2)

Q59 Nicotine vape products **discounted** inside store?

- Yes (1)
- No (0)
- Can't determine (2)

Q60 Pipe/roll-your-own tobacco

Q61 **Pipe/roll-your-own** tobacco sold? (e.g., Backwoods, Bugler)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Pipe/RYO: Sold = Yes (Q61 = 1)

Q62 **Explicit flavors** of pipe/roll-your-own tobacco sold? (e.g., menthol, fruit)

- Yes (1)
- No (0)
- Can't determine (2)

Q63 Hookah pipes

Q64 **Hookah pipes** sold?

- Yes (1)
- No (0)
- Can't determine (2)

Q65 Shisha tobacco

Q66 **Shisha tobacco** sold? (e.g., Starbuzz, Al Fakher, Fumari)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Shisha tob: Sold = Yes (Q66 = 1)

Q67 **Explicit flavors** of shisha tobacco sold? (e.g., Fruit/candy, menthol/mint, alcohol)

- Yes (1)
- No (0)
- Can't determine (2)

Q68 Shisha tobacco **advertised** inside store?

- Yes (1)
- No (0)
- Can't determine (2)

Q69 Any sign for "**hookah**" inside store?

- Yes (1)
- No (0)
- Can't determine (2)

Q70 **Mobile coupons** for any tobacco product advertised inside store? ***Note:*** *Mobile coupons must say "mobile coupons"*

- Yes (1)
- No (0)
- Can't Determine (2)

Q71 Nicotine lozenges, tablets or gum

Q72 **Nicotine lozenges, tablets or gum** which are NOT approved for quitting sold? (e.g., Velo, Rogue, Lucy)
***Note**: Do NOT include Nicorette, NicoDerm, Habitrol*

- Yes (1)
- No (0)
- Can't determine (2)

Q73 Products to add menthol to regular cigarettes

Q74 Products to **add menthol** to regular cigarettes sold? (e.g., flavor cards, flavor tubes, pellets)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Cig: non-menth sold = Yes (Q30 = 1)
Q75 Newport new **"non-menthol"** hardpack

Display This Question: If Cig: non-menth sold = Yes (Q30 = 1)
Q76 Price?

- Enter price listed (1)
- Enter price from clerk (2)
- Not sold (0)
- Can't determine (3)

Display This Question:
If Newport non-menth: Price = Enter price listed (Q76 = 1)
Or Newport non-menth: Price = Enter price from clerk (Q76 = 2)
Q77 $_ _._ _ (e.g., ##.##)

- Enter price (4) _____

Display This Question:
If Newport non-menth: Price = Enter price listed (Q76 = 1)
Or Newport non-menth: Price = Enter price from clerk (Q76 = 2)
Q78 Price includes **sales tax**?

- Yes (Tax included) (1)
- No (Plus tax) (0)
- Can't determine (2)

Display This Question: If Products sold: = Any cigarettes [Yes] (Q9_1 = 1)

Q79 Newport **red** hardpack

Display This Question: If Products sold: = Any cigarettes [Yes] (Q9_1 = 1)

Q80 Price?

- Enter price listed (1)
- Enter price from clerk (2)
- Not sold (0)
- Can't determine (3)

Display This Question:

If Newport Red: price = Enter price listed (Q80 = 1)

Or Newport Red: price = Enter price from clerk (Q80 = 2)

Q81 $_ _._ _ (e.g., ##.##)

- Enter price (4) _____

Display This Question:

If Newport Red: price = Enter price listed (Q80 = 1)

Or Newport Red: price = Enter price from clerk (Q80 = 2)

Q82 Price includes **sales tax**?

- Yes (Tax included) (1)
- No (Plus tax) (0)
- Can't determine (2)

Display This Question: If Products sold: = Any cigarettes [Yes] (Q9_1 = 1)

Q83 **Cheapest cigarette pack**

Ask the cashier, "What's the **cheapest single pack of cigarettes**? How much is it?" If the cashier refuses, obtain the cheapest pack price by looking at advertised prices.

Display This Question: If Products sold: = Any cigarettes [Yes] (Q9_1 = 1)

Q84 Price?

- Enter price listed (1)
- Enter price from clerk (2)
- Can't determine (3)

Display This Question:

If Cheapest cig: Price = Enter price listed (Q84 = 1)

Or Cheapest cig: Price = Enter price from clerk (Q84 = 2)

Q85 $_ _._ _ (e.g., ##.##)

- Enter price (4) _____

Display This Question:

If Cheapest cig: Price = Enter price listed (Q84 = 1)

Or Cheapest cig: Price = Enter price from clerk (Q84 = 2)

Q86 Price includes **sales tax**?

- Yes (Tax included) (1)
- No (Plus tax) (0)
- Can't determine (2)

Q87 **Please exit the store to answer the next questions about outside the store. This area includes the building, windows, sidewalk, parking lot, and fences.**

Q88 **Mobile coupons** for any tobacco product advertised outside?
Note: Mobile coupons must say "mobile coupons"

- Yes (1)
- No (0)
- Can't determine (2)

Q89 Shisha tobacco **advertised** outside? (e.g., Starbuzz, Al Fakher, Fumari)

- Yes (1)
- No (0)
- Can't determine (2)

Q90 Any sign for "**hookah**" outside?

- Yes (1)
- No (0)
- Can't determine (2)

Q91 Nicotine pouches **advertised** outside? (e.g., Zyn, Velo, on!)

- Yes (1)
- No (0)
- Can't determine (2)

Q92 Nicotine pouches **discounted** outside?

- Yes (1)
- No (0)
- Can't determine (2)

Q93 Any cigarettes **advertised** outside?

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any cig: Ext ad = Yes (Q93 = 1)

Q94 New **"non-menthol"** cigarettes **advertised** outside? (e.g., Newport "non-menthol," Newport EXP, Camel Crush/Crisp, Kool)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any cig: Ext ad = Yes (Q93 = 1)

Q95 **Menthol** cigarettes **advertised** outside? (e.g., Newport menthol, Camel Crush menthol, Marlboro Menthol)

- Yes (1)
- No (0)
- Can't determine (2)

Q96 Any cigarettes **discounted** outside?

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any cig: Ext discount = Yes (Q96 = 1)

Q97 New **"non-menthol"** cigarette **discounts** outside? (e.g., Newport "non-menthol," Newport EXP, Camel Crush/Crisp, Kool)

- Yes (1)
- No (0)
- Can't determine (2)

Q98 Any cigarillos **advertised** outside? (e.g., Swisher Sweet, Black & Mild, Backwoods, White Owl)

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any cigarillo: Ext ad = Yes (Q98 = 1)

Q99 **Explicit flavors** of cigarillos **advertised** outside? (e.g., fruit/candy, menthol/mint, alcohol)

- Yes (1)
- No (0)
- Can't determine (2)

Q100 Any nicotine vape products **advertised** outside store?

- Yes (1)
- No (0)
- Can't determine (2)

Display This Question: If Any nic vape: Ext ad = Yes (Q100 = 1)

Q101 **Explicit flavors** of nicotine vape products **advertised** outside store? (e.g., fruit/candy, menthol/mint, alcohol, banana ice)

- Yes (1)
- No (0)
- Can't determine (2)

Q102 Any nicotine vape products **discounted** outside?

- Yes (1)
- No (0)
- Can't determine (2)

Q103 Sign indicates **age 21 to enter**? ***Note****: These signs can be handwritten or professionally manufactured.*

- Yes (1)
- No (0)
- Can't determine (2)

Q104 Is there any evidence of flavored tobacco sales? (e.g., flavored products hidden from view behind curtain, in boxes or in drawers, saw a clerk sell flavored products)

- ○ Yes (1)
- ○ No (0)
- ○ Can't determine (2)

Display This Question:

If Evidence of flav tob sold = Yes (Q104 = 1)

Or Evidence of flav tob sold = Can't determine (Q104 = 2)

Q105 What did you see?

_____

Q106 Final disposition: (Select one)

Display This Choice: If Attempt survey = Yes (Q7 = 1)

- ○ Completed (1)

Display This Choice: If Attempt survey = Yes (Q7 = 1)

- ○ Store does not sell any tobacco products (2)

Display This Choice: If Attempt survey = No (Q7 = 0)

- ○ Incomplete, store is permanently closed (3)

Display This Choice: If Attempt survey = No (Q7 = 0)

- ○ Incomplete, store is temporarily closed (4)

Display This Choice:

If Attempt survey = No (Q7 = 0)

Or Attempt survey = Yes (Q7 = 1)

- ○ Incomplete, membership or fee required to enter (5)

Display This Choice:

If Attempt survey = No (Q7 = 0)

Or Attempt survey = Yes (Q7 = 1)

- ○ Incomplete, environment is unsafe for me (6)

Display This Choice:

If Attempt survey = No (Q7 = 0)

Or Attempt survey = Yes (Q7 = 1)

- ○ Incomplete, asked to leave before completing survey (7)

Display This Choice:

If Attempt survey = No (Q7 = 0)

Or Attempt survey = Yes (Q7 = 1)

- ○ Incomplete, other (8)

Q107 Additional comments (Optional)

_____

_____

End of Block: Survey questions