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ABSTRACT

Objectives Although tobacco is the leading preventable cause of death in the USA, it is routinely sold in pharmacies. In 2008, San Francisco became the first city in the USA to pass a tobacco-free pharmacy ordinance. Over the next decade, 171 municipalities enacted similar policies, and in 2018, Massachusetts banned tobacco sales in pharmacies. Our objective was to assess the perceived effects of tobacco-free pharmacy policies on displays, sales, customer visits and counselling.

Design Observational study and survey.

Setting In 2017, we visited Walgreens and CVS stores in San Francisco and nearby San Jose, which allows tobacco sales, to assess placement of tobacco and over-the-counter tobacco cessation products (nicotine replacement therapy or NRT). We surveyed an employee at each site regarding the impact that tobacco-free pharmacy policies had had on customer traffic and sales of NRT.

Participants We obtained display data from 72 pharmacies and collected surveys from 55 employees (76% response rate).

Results A majority of respondents at tobacco-free pharmacies (55%) reported that the policy had not affected customer visits. In comparison, 70% of respondents at tobacco-selling pharmacies believed that eliminating tobacco sales would reduce the number of customers visiting their stores. Pharmacies that were tobacco free and those that sold tobacco reported comparable displays, sales and counselling for NRT.

Conclusions Pharmacies operating under tobacco-free policies did not report reduced customer visits. Greater awareness of this outcome could help pharmacies implement public health recommendations to eliminate tobacco sales.

INTRODUCTION

Tobacco is the leading preventable cause of death in the USA, causing over 480 000 deaths per year.¹ In most high-income countries pharmacies do not sell tobacco,² but in the USA this is common; an estimated 80% of prescriptions in 2014 were filled at pharmacies that sell tobacco.^{3–5} Pharmacies that

Strengths and limitations of this study

- This paper provides new evidence about tobacco-free pharmacy policies at the community pharmacy level. Other recent studies have focused on how these policies affect retailer density and smoking prevalence.
- Our local study of cities with and without tobacco-free pharmacy policies updates older research on community pharmacies.
- Findings may be relevant to low-income and middle-income countries where pharmacies continue to sell tobacco.
- The study is limited by its focus on two municipalities—San Francisco has a long-standing tobacco-free pharmacy ordinance and may differ from localities that have recently passed similar ordinances—and its use of observational data.

sell tobacco are also more likely to encourage its use; tobacco prices are lower in pharmacies relative to other stores,⁶ and chain pharmacies are more likely than independents to stock tobacco products and sell them to minors.^{7–11} Pharmacies also sell tobacco products and promote smoking in low-income and middle-income countries (LMICs).^{12 13}

Tobacco sales in US pharmacies persist despite calls to ban the practice by multiple health organisations,³ the finding that only 2% of pharmacists favour it² and widespread public support for tobacco-free pharmacies.^{14–16} In LMICs, these sales persist even in countries that are part of the Framework Convention on Tobacco Control.¹³ US chain pharmacies are more likely to sell tobacco than independents⁴ and have expressed fears that they will lose sales as justification for the practice.^{17 18} This decision to sell tobacco has raised increasing questions as chain pharmacies develop new ‘wellness store’ formats

to expand access to primary care,² given that providing healthcare (including smoking cessation) is inconsistent with selling tobacco, a deadly product.^{19–22}

In 2008, San Francisco became the first city in the USA to establish standalone tobacco-free pharmacies; the ordinance was expanded in 2010.^{20 21} The CVS corporation discontinued sales of tobacco at all US locations in September 2014.²³ By March 2018, 171 cities (the majority located in Massachusetts) had enacted tobacco-free pharmacy ordinances, less than 1% of US municipalities,^{24 25} and in July 2018, Massachusetts prohibited tobacco sales in pharmacies statewide.²⁶ Studies suggest that tobacco-free pharmacies reduce retailer density,^{27–29} and this reduced density leads to lower smoking initiation and prevalence.^{30–38} Survey research has shown that both pharmacists and the general community support tobacco-free pharmacies after implementation,^{2 16} and media coverage has been favourable.³⁹ Reports on sales and profitability after the CVS chain became tobacco free suggest that initial financial losses from eliminating tobacco sales in the first year^{22 30 40} were made up after the first year with increased sales of other products,^{41–43} in particular, with increased sales of nicotine replacement therapy (NRT).⁴⁴

Despite this work, there has been limited study on the perceived effects of tobacco-free pharmacy policies on pharmacies themselves. Although ownership of chain pharmacies is centralised, local policies may determine whether and how they sell tobacco.⁴⁵ Salient questions include whether fears of reduced customer visits are valid, whether tobacco-selling pharmacies near tobacco-free localities change their displays to attract these potential lost customers, whether store layouts change after the elimination of tobacco ‘power walls’ behind cash registers⁴⁶ and whether eliminating tobacco sales encourages customers to seek pharmacist assistance with smoking cessation. Existing studies of tobacco and NRT accessibility have assessed product availability by neighbourhood within cities; however, these studies did not compare tobacco-selling and tobacco-free pharmacies or survey employees to identify reasons that products were or were not stocked.^{47 48}

The goal of this study was to assess the perceived effects of tobacco-free pharmacy policies on chain pharmacies. We focused on three outcomes: (1) the display of tobacco products and over-the-counter nicotine NRT, (2) the perceived impact of a tobacco-free policy on customer visits and (3) whether stores reported that customers purchasing NRT received counselling from pharmacists.

METHODS

We conducted a cross-sectional study in chain pharmacies consisting of: (A) direct observation of product placements and (B) a survey of employees. This two-part study design made it possible to validate self-reports using observational data and identify justifications for different store display choices. The study included

chain pharmacies in two localities: San Francisco, which passed a tobacco-free pharmacy law in 2008, and a nearby city, San Jose, which contained a roughly equivalent number of stores. The primary chains operating in both cities were Walgreens and CVS; at the time of data collection, all Walgreens stores in San Jose were able to sell tobacco products (another major US pharmacy chain, Rite Aid, had locations in San Jose but not in San Francisco and was excluded due to the absence of comparison cases). CVS stores had been tobacco-free throughout the USA since 2014 and served as a control case for both cities. We identified all pharmacies in each city by visiting each company’s website and searching by city name. After consulting with a regional manager for one chain, we explicitly excluded stores located in tourist areas (eg, Fisherman’s Wharf in San Francisco) because their business did not involve repeat customers, and their layouts and product lines (eg, souvenirs) were substantially different from those of other stores. We also excluded CVS branches located inside Target stores, because their store layouts were not controlled by CVS and their customer traffic included secondary visits made by Target shoppers.

We followed existing protocols for conducting observations of stores that sell tobacco, based on prior research, modified to reflect a study design containing only pharmacies by removing assessments of measures such as store type.^{49 50} After completing online research training in collection of observational data and survey research, one study author (LP) visited all Walgreens and CVS pharmacies that met the study inclusion criteria in April 2017 during normal business hours (ranging between 08:00 and 10:00). Data collected at each location included: (A) photographs of tobacco products and/or tobacco cessation products (NRT) on display; (B) measurements of the distance from the store entrance to each display; (C) a 10-question survey completed by the store manager, assistant manager or shift lead via the Qualtrics iPad application; and (D) any additional information volunteered by survey respondents. Stores were revisited up to two times if no one was available to complete the survey on the initial visit.

The survey relied on a validated instrument created as part of a peer reviewed study of NRT sales in community pharmacies in northern California.⁵¹ It was revised to include tobacco products based on input from a Walgreens store manager and UCSF tobacco control researchers. There were two versions of the survey instrument: one for tobacco-free pharmacies and one for tobacco-selling pharmacies (see online supplementary appendix for survey instruments). The surveys requested verbal consent from participants followed by requests for information on locations of NRT and/or tobacco products to validate observational data, sales data, frequency of pharmacist smoking cessation counselling prior to consumer NRT purchase, factors that could impact product placement such as perceived theft risk and the perceived impact of tobacco-free pharmacy policies on

customer visits. Stata V.13 was used to conduct Fisher's exact and Pearson's χ^2 tests of statistical significance.

Patient and public involvement: The study did not involve patients. Participants were not involved in planning the design, recruitment or conduct of the study and did not advise on the interpretation of the results or preparation of the manuscript. There are no plans to disseminate the study results to participants.

RESULTS

Study characteristics

The corporate websites for Walgreens and CVS pharmacies identified 119 stores in San Francisco and San Jose. We excluded 47 of these stores on the grounds based on our exclusion criteria (located inside Target stores, in tourist areas or closed at the time of data collection), resulting in a total 72 stores in our sample. After visiting and surveying the stores in the sample, we obtained complete data on product placement for all stores (n=72); the response rate for the survey was 76% (n=55). The majority of surveys (n=35, 64%) were completed by store managers; in stores where the manager was not on site at the time of visit, the survey was completed by the assistant manager (n=18, 33%) or the shift lead (n=2, 4%). Most of the pharmacies in our sample were operated by Walgreens (n=48, 67%). Overall, more stores were located in San Francisco (n=39, 54%) than San Jose. Most stores in the sample (n=56, 78%) did not sell tobacco. Characteristics of the sample and the survey respondents are provided in [table 1](#).

Displays of tobacco products and NRT were similar within store type

Pharmacy product displays seek to both market through exposure by showing customers potential purchases and to limit access to products in order to prevent theft. The

pharmacies in our sample placed NRT and (if relevant) tobacco products in similar locations.

Tobacco-selling pharmacies (Walgreens locations in San Jose only) placed tobacco products behind the cash registers, in the traditional 'power wall' position favoured by tobacco companies to drive tobacco product sales. These stores placed NRT directly adjacent to the tobacco products, as shown in [figure 1](#). Survey reports were consistent with these findings; respondents from tobacco-selling pharmacies reported that both tobacco and NRT products were stored behind the cash register (100%, n=10) and next to the entrance of the store (60%, n=6). Less than half of these respondents reported that NRT was at high risk of theft (n=3, 30%) or that the location of NRT products was influenced by the risk of theft. Results are shown in [table 2](#).

Tobacco-free pharmacies (CVS stores in both cities and Walgreens stores in San Francisco) placed NRT in different locations depending on ownership. All Walgreens stores located NRT directly behind the cash registers, on the power wall. CVS stores placed NRT behind the cash registers on the power wall, as well as on aisle caps (see [figure 1](#)). Consistent with this evidence, NRT was located behind the cash registers (89% of sites) and at the front door entrance (38% of sites). Respondents at tobacco-free pharmacies reported NRT was at high risk of theft (51%, n=23). Nearly half of these respondents (49%, n=22) stated that NRT product location is impacted by theft; however, placing NRT behind a counter appeared to resolve the risk, given that few respondents reported that NRT was stored in locked bins (4%, n=2). Another 42% (n=19) of respondents reported that NRT placement was affected by other reasons such as store plan protocols (13%, n=6). Tobacco products and NRT were stored in comparable locations at all tobacco-selling pharmacies, and NRT was stored in the same locations in all tobacco-free pharmacies.

Experience and expectations about customer visits in tobacco-free pharmacies differed by store type

We found significant differences in the perceived effects of tobacco-free policies on customer visits, which reflected whether the stores had actually implemented these policies. An overwhelming majority of respondents at tobacco-selling pharmacies believed that eliminating tobacco sales would result in fewer customers visiting the store. In contrast, most tobacco-free pharmacies, whether in San Francisco or operated by CVS, reported that eliminating tobacco sales had not resulted in reduced customer visits.

There were significant differences in expectations about customer traffic for tobacco-free pharmacies. Respondents from tobacco-selling pharmacies, 70% (n=7) reported that they believed fewer customers would visit their stores if tobacco product sales were eliminated. Despite this expectation, which implied that tobacco-purchasing customers would change their shopping habits, 90% of respondents (n=9) reported that they had not changed their tobacco product displays after competing

Table 1 Sample characteristics		
	N	Per cent
Pharmacies	72	100
Company		
CVS	24	33
Walgreens	48	67
Location		
San Francisco	39	54
San Jose	33	46
Store type		
Tobacco free	56	78
Tobacco selling	16	22
Survey respondents	55	100
Position		
Store manager	35	64
Assistant manager	18	33
Shift lead	2	4

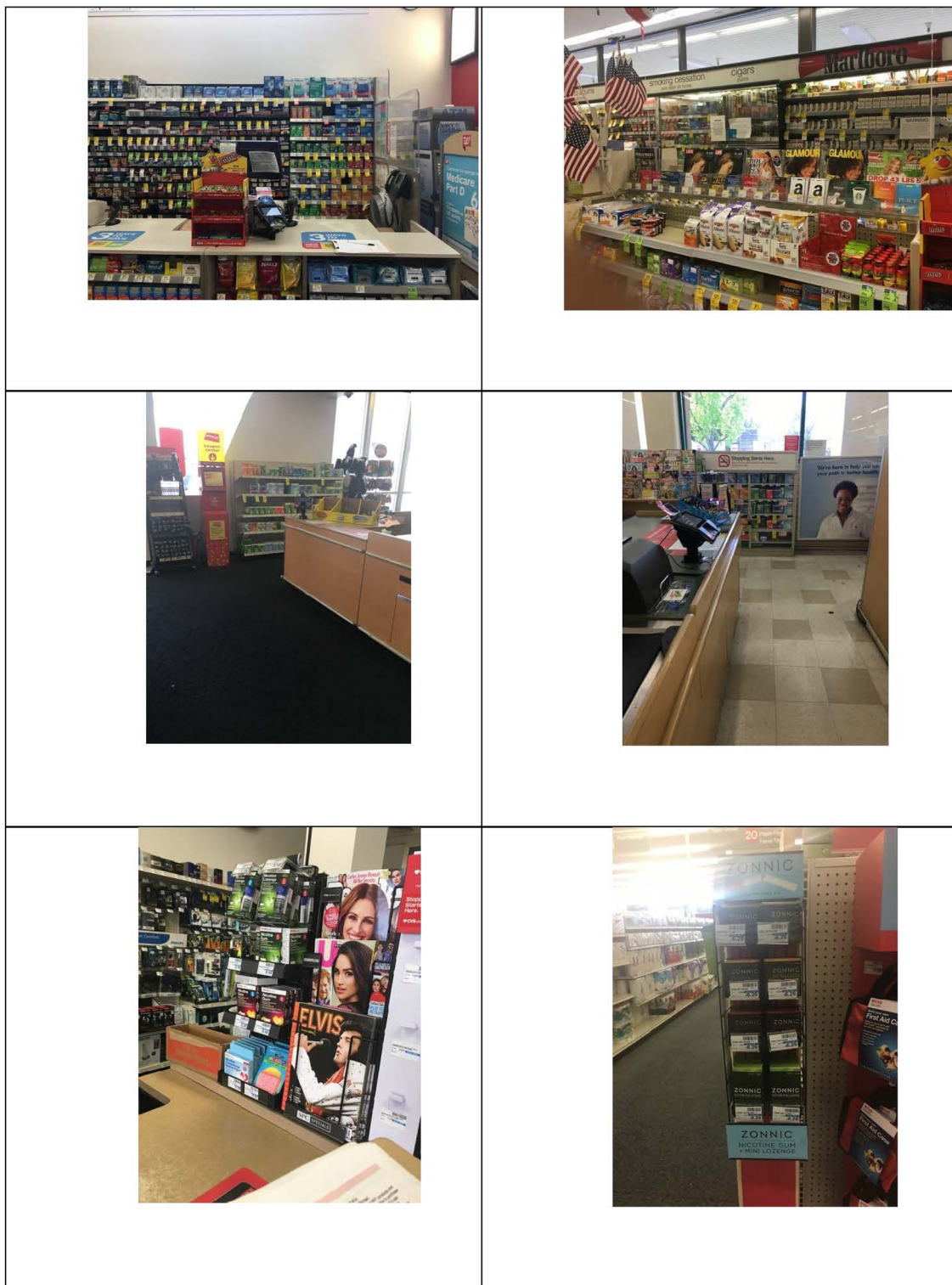


Figure 1 Tobacco and NRT placements differ by pharmacy store type and owner: Walgreens behind cash registers; CVS behind cash registers and on end caps (San Francisco (SF) and San Jose (SJ)). (top left) NRT behind cash registers (Walgreens, SF); (top right) tobacco products behind cash registers (Walgreens, SJ); (middle left) NRT near pharmacy (CVS, SF); (middle right) NRT near pharmacy (CVS, J); (bottom left) NRT on cash register shelves (CVS, SF); and (bottom right) NRT on an aisle end (CVS, SJ). NRT, nicotine replacement therapy.

stores stopped selling tobacco products. In contrast, a majority of tobacco-free pharmacy respondents reported that eliminating their tobacco product sales did not influence customer traffic (56%, n=25), where they placed

NRT in the stores (78%, n=35) or NRT sales (60%, n=27). Results are shown in [table 3](#).

We found no significant differences in reported NRT sales and reported tobacco product displays by store type

Table 2 Survey responses addressing product placement

	NRT	Tobacco products
	Placement behind cash register	
Tobacco-free pharmacies	40 (89%)	0 (0%)
Tobacco-selling pharmacies	6 (60%)	10 (100%)
Fisher's exact (p)	0.001	
	Placement by store entrance	
Tobacco-free pharmacies	17 (38%)	0 (0%)
Tobacco-selling pharmacies	7 (70%)	6 (60%)
Fisher's exact (p)	0.003	

NRT, nicotine replacement therapy.

($p=0.079$). In contrast, the expectations of tobacco-selling pharmacy respondents were significantly different from the outcomes reported by tobacco-free pharmacy respondents with respect to customer traffic ($p=0.047$).

Most customers purchased NRT without a pharmacist consultation

Most respondents from tobacco-selling pharmacies (70%, $n=7$) reported that customers rarely purchased NRT, that the overwhelming majority purchased NRT without a pharmacist consultation (80%, $n=8$) and that employees did not ask customers if they would like a pharmacist consultation prior to purchasing NRT. Similarly, most respondents from tobacco-free pharmacies (76%, $n=34$) reported that customers rarely purchased NRT, that an overwhelming majority purchased NRT without a pharmacist consultation (73%, $n=33$) and that employees did not ask customers if they would like a pharmacist consultation prior to purchasing NRT (89%, $n=40$). The differences between store types were not statistically significant.

DISCUSSION

This study sought to expand on existing research reviewing tobacco-free policies by evaluating specific outcomes relevant to pharmacies including reported customer visits to

stores, reported NRT sales and observed NRT displays at pharmacies. Our findings suggest that tobacco-free pharmacies were not significantly different from tobacco-selling pharmacies with respect to any of these three outcomes. Chain pharmacies have expressed a belief that selling tobacco products attracts customers; however, our respondents reported that customer visits did not change when pharmacies stopped selling tobacco. Reported NRT sales were also comparable across store types. Our observational data found that stores had similar displays across the entire sample. Survey data revealed that displays often reflected store plan protocols created at the corporate level for all sites in a region, which is likely to have been responsible for the limited variation we observed.

We also considered potential differences in counseling requests for NRT. CVS as a corporation has reported overall increased NRT sales after implementing its tobacco-free policy,⁴⁴ suggesting that sales of NRT, as well as customer expectations about the role of pharmacists in smoking cessation, could change after eliminating tobacco sales. The appropriate use of tobacco cessation aids is not always intuitive to new users; for example, nicotine gum should not be chewed repeatedly, and it can be combined with patches to reduce cravings.⁵² To assess whether customers were more likely to seek help

Table 3 Perceived effects of tobacco-free pharmacy policies

	Increased	Decreased	No change
	NRT sales, n (%)		
Tobacco-free pharmacies*	13 (29)	2 (4)	27 (60)
Tobacco-selling pharmacies	0 (0)	1 (10)	9 (90)
Fisher's exact (p)	0.079		
	Percent of customers who visit, n (%)		
Tobacco-free pharmacies*	4 (9)	10 (22)	25 (55)
Tobacco-selling pharmacies	0 (0)	7 (70)	3 (30)
Fisher's exact (p)	0.047		

*Note: three respondents reported not knowing the NRT sales changes, and six respondents reported not knowing the impact on customers the law has had.

in tobacco-free pharmacies, we asked respondents in tobacco-selling and tobacco-free pharmacies to indicate the likelihood of NRT purchasers seeking assistance from pharmacists. We found no differences between store types.

Previous research on tobacco sales in pharmacies has noted that selling tobacco conflicts with the self-identified mission of pharmacies, which is to promote the well-being of their customers.² Before the passage of San Francisco's tobacco-free pharmacy ordinance, the majority of the city's pharmacies placed NRT products next to cigarettes.⁵³ We found that tobacco-selling pharmacies continued this product placement; like San Francisco pharmacies 15 years earlier, San Jose Walgreens stores placed NRT next to tobacco products. Combining these product displays is problematic, because it undercuts the purpose of smoking cessation aids by promoting tobacco. In addition, tobacco-selling pharmacies placed tobacco products by the entrance, a pivotal location because it increases the convenience of tobacco purchases as well as advertising their use to everyone entering the store.⁴⁶ The creation of the 'power wall' was based on tobacco industry research showing that placing cigarettes directly behind cash registers would repeatedly expose consumers to tobacco products and to positive messages about tobacco, increasing tobacco sales and use.⁴⁶ Tobacco-free pharmacies, in contrast, typically replaced the tobacco products formerly sold in this location with NRT, promoting tobacco cessation instead of tobacco use.

The employees we surveyed reported that over-the-counter NRT was typically purchased without a pharmacist consultation and that employees (whether they themselves were pharmacists) did not suggest that purchasers consult a pharmacist. The purpose of NRT is to aid in smoking cessation by replacing the use of tobacco products, and with proper use and a tapering regimen, can help eliminate the addiction to nicotine.⁵² Information about how to use and taper NRT is one of counselling points that pharmacists can provide to people who are making a quit attempt. NRT is most effective when combined with counselling that helps identify and resolve smoking triggers; and patients who do not receive simultaneous counselling are likely to find NRT ineffective.^{54,55} Patients who do not receive counselling also have a greater risk of becoming addicted to NRT given that they may not be aware of when and how to properly taper down the nicotine content.⁵² Our research suggests that all pharmacies could be more assertive in encouraging NRT purchasers to consult with pharmacists at the time of sale.

Although we did not ask directly about perceptions on tobacco-free pharmacy policies, two survey respondents volunteered that they were preferred working at a tobacco-free pharmacy and that this change created a healthier environment for their community by removing tobacco advertising in the form of visible product placement. This stated preference for working in a tobacco-free pharmacy is consistent with previous research.⁵⁶ Future studies could

expand on these surveys by including the perceptions of other pharmacy employees, including management.

Our research has limitations. We focused on only two municipalities; because we chose to study San Francisco due to its long-standing tobacco-free pharmacy ordinance, it is possible that our findings may not reflect the experience of localities that have recently passed similar ordinances. These two localities are primarily served by two chains, Walgreens and CVS; because CVS is now a tobacco-free pharmacy, our sample included only 16 tobacco-selling pharmacies. Given recent efforts by the US Food and Drug Administration to curtail tobacco sales at Walgreens,⁸ a small share of tobacco-selling pharmacies may be increasingly representative of other localities. We could not survey pharmacies that had closed between the implementation of the San Francisco ordinance (or after CVS changed its policy in 2014) and our 2017 survey. Similarly, our research specifically excluded pharmacies in tourist areas and CVS locations within Target stores; these locations may have different displays and different customer interactions. Only one observer visited and photographed the study sites, potentially biasing findings and making it impossible to calculate inter-rater reliability. The research was cross-sectional in nature, which did not allow us to validate the perceived effects of tobacco-free pharmacy policies. The study did not explicitly address the availability of alternative tobacco products including e-cigarettes, little cigars and cigarillos, and smokeless tobacco, did not consider medications for cessation like varenicline and bupropion, which are not available over the counter in the USA, did not collect price data and did not validate respondent reports of sales with financial data because these data are proprietary.

Overall, our findings suggest that the concerns expressed by chain pharmacies that eliminating tobacco sales will reduce their customer traffic have not been borne out. In addition, the modification of store displays in tobacco-free pharmacies to place NRT in prominent positions formerly occupied by tobacco products, including the power wall, suggests that these stores now promote tobacco cessation rather than tobacco use. These displays communicate an abstinence message even if they do not result in greater onsite sales of NRT. Finally, our findings suggest that all pharmacies could promote pharmacist counselling on NRT use more effectively, increasing the chances that tobacco users will successfully quit.

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Contributors DEA and LP conceived and designed the paper, interpreted the results, reviewed and revised the manuscript in preparation for publication and read and approved the final manuscript. LP collected the data and wrote the first draft.

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Competing interests None declared.

Patient consent for publication Not required.

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Data sharing statement Additional data, including specific product placements in each store and deidentified survey responses, are available by emailing the corresponding author.

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