



Vape shop and consumer activity during COVID-19 non-essential business closures in the USA

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ABSTRACT

Introduction Vaping and vape shops pose risk for COVID-19 and its transmission.

Objectives We examined vape shop non-compliance with state-ordered business closures during COVID-19, changes in their marketing and experiences among consumers.

Methods As part of a longitudinal study of vape retail in six metropolitan statistical areas (MSAs; Atlanta, Boston, Minneapolis, Oklahoma City, San Diego and Seattle), we conducted: (1) legal research to determine whether statewide COVID-19 orders required vape shops to close; (2) phone-based and web-based surveillance to assess vape shop activity in March–June 2020 during shelter-in-place periods; and (3) a concurrent online survey of e-cigarette users about their experiences with vape retail.

Results Non-essential business closure varied in timing/duration across states and applied to vape shops in California, Massachusetts, Minnesota, Oklahoma (for a brief period) and Washington (Georgia's orders were ambiguous). Surveillance analysis focused on the five MSAs in these states. Of 156 vape shops, 53.2% were open as usual, 11.5% permanently closed and 3.8% temporarily closed; 31.4% offered pick-up/delivery services. Among survey respondents (n=354, $M_{age}=23.9\pm 4.6$; 46.9% male, 71.8% white, 13.0% Hispanic), 27.4% worried their vape shop would close/go out of business during COVID-19; 7.3% said their vape shop did so. Few noticed increases in vape product delivery options (7.3%), discounts/price promotions (9.9%) and/or prices (9.3%). While 20.3% stockpiled vape products, 20.3% tried to reduce use and 15.8% tried to quit.

Conclusions Many vape shops were non-compliant with state COVID-19 orders. E-cigarette users were as likely to stockpile vape products as to attempt to reduce or quit using e-cigarettes.

INTRODUCTION

Smoking and vaping are harmful to lung health, thus implicating potential risk for contracting COVID-19 and disease severity.^{1–6} Thus, how the tobacco and vape industry, as well as consumers of these products, react to or experience COVID-19 warrants research.

Vape shops represent unique, widespread tobacco specialty retailers with important implications for vaping.⁷ Some surveillance studies suggest that up to 90% of vape shops permit product sampling, and two-thirds house lounges where patrons can vape,⁷ underscoring potential risk of vape shops facilitating COVID-19 transmission.^{8,9} In the USA, some states

required temporary closure of tobacco specialty retailers during COVID-19 related shelter-in-place periods, despite lobbying efforts by retailers and manufacturers.^{10–12}

Little is known about whether vape shops complied with state-ordered temporary business closures. One study found that, in a sample of 88 vape shops in Southern California, 61.4% were open during California's first shelter-in-place period,¹³ regardless of state orders mandating them to close.¹⁴ Moreover, similar to tobacco companies, vape product manufacturers exploited the COVID-19 crisis in their marketing.¹⁵

E-cigarette consumers have had varied reactions to COVID-19. One study of e-cigarette users in five countries observed that vaping was considered less of a risk for COVID-19 relative to smoking and that e-cigarette consumption marginally increased during lockdown.¹⁶ Another study documented that almost half of US e-cigarette users in an mTurk panel reported no change in e-cigarette (or cigarette) use; however, ~25% attempted to reduce e-cigarette use and >20% attempted to quit to reduce COVID-19 risk.¹⁷ Some quitline data also showed greater utilisation in March 2020 versus March 2019.¹⁸

Expanding prior research, this study examined vape shop retail in six US states, using data from: (1) legal research determining whether vape shops were required to close as non-essential businesses under statewide COVID-19 orders; (2) phone-based and web-based surveillance assessing retailer practices for a sample of vape shops in March–June 2020, during the initial shelter-in-place periods; and (3) a concurrent online survey of young adult e-cigarette users about their experiences with vape retail in these study sites.

METHODS

This study was conducted as part of the Vape shop Advertising, Place characteristics and Effects Surveillance (VAPES) study, which examines the vape shop retail environment and its impact on vaping and tobacco use among young adults.¹⁹ VAPES study sites are six metropolitan statistical areas (MSAs; Atlanta, Georgia; Boston, Massachusetts; Minneapolis, Minnesota; Oklahoma City, Oklahoma; San Diego, California; and Seattle, Washington), selected for representation across US regions and variation in state tobacco control.^{20,21}

Statewide COVID-19 orders

We used Public Health Law Center data for the six statewide COVID-19 orders and related guidance



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documents (derived via online research of official state websites and news coverage beginning in February 2020) to determine whether vape shops were required to be closed to the public for on-site retail sales in these six states and, if so, when the mandated closures went into effect and expired. We considered using local jurisdiction orders in analyses; however, statewide orders from the five states that required vape shops to close superseded local jurisdictions' authority to implement less restrictive closures for the duration of the statewide restrictions. Thus, we used data about statewide orders to interpret vape shop surveillance data.

Telephone/online surveillance

Applying procedures used previously in the VAPES study,^{7 22} we created a sampling frame from Google and Yelp searches for stores tagged by retailers or customers as vape shops and then called them to determine whether stores fit the definition of 'vape shop' (ie, do not sell conventional tobacco products) and verified store name/location. For the most recent sample, calls were made from March to June 2020, and research staff additionally asked whether stores were open as usual and/or offered curbside pick-up and/or home delivery. Open stores were also asked if they sold food to ascertain whether retailers might fit a possible exemption for essential businesses. Research staff made notes of other comments made by vape shop personnel (eg, qualitatively coded/presented). Three calls were attempted at different times of day and days of the week, and outcomes of each were coded (eg, not a working number, no answer and voicemail). For stores without clear dispositions after three attempts, research staff conducted online searches for retailer websites and social media pages to determine whether stores met our criteria for vape shops and obtain any information about being open (and hours of operation), pick-up/home delivery and permanent/temporary closures (using existing protocols^{7 13 22}). Analyses were restricted to vape shops with data about their operational status specifically during the statewide closure orders.

Young adult survey

In the context of a 2-year, five-wave longitudinal online survey study of 3006 young adults (ages 18–34 years) that launched in fall 2018, we interrupted the spring 2020 (wave 4) data collection in order to add additional items related to COVID-19 to the survey. These items were included in the survey for the 1559 participants who were scheduled to be sent the survey after 15 March. Participants in the current analyses were contacted between 24 March and 1 June (response rate 69.5%; n=1084); past 6-month e-cigarette use was reported by 354 (32.7%; n's ranging from 26 in Atlanta to 90 in Minneapolis). Participants were asked, 'During COVID-19, did you experience any of the following? (Check all that apply)' (eg, their vape shop closed; difficulty accessing vape products; noticing increases or decreases in advertisements, prices and/or discounts; stocking up on vape products; and trying to quit/cut down).

Data analysis

Using SPSS V.26, descriptive analyses were conducted to summarise vape shop activity and participant survey responses.

RESULTS

Analysis of statewide COVID-19 orders

Time frames for temporary closures of non-essential businesses varied across states (*detailed data available on request*). Vape shops were declared as non-essential businesses in four of the six states, requiring their closure (ie, California: 19 March–7 May;

Massachusetts: 27 March–7 June 7; Minnesota: 27 March–17 May; Washington: 25 March–31 May). In Oklahoma, vape shops should have been required to close as 'non-critical sector businesses' for a limited period (25 March–1 April), until the statewide order was amended to identify all tobacco shops as essential businesses beginning 1 April (online supplemental figure). In Georgia, the statewide order was ambiguous enough that vape shops may have remained open, unless localities established more stringent closure regulations. Additionally, some states explicitly allowed curbside pick-up or home delivery at different points, while closure orders were being enforced (although unclear in most cases).

Phone/online surveillance

Surveillance analysis focuses on the five MSAs in states with executive orders indicating necessary closures of vape shops during any time period. Of the 1049 unique retailers identified via webscrapes in these five MSAs, 237 (22.6%) were confirmed as vape shops via phone or online activity searches (the remainder had inaccurate phone numbers, were not retailers or were unable to be determined, eg, no answer, non-descriptive answering machine, no website or online activity). Of the 237 confirmed vape shops, we were able to document activity/status (including potential closures) within the respective state closure orders among 156 vape shops (65.8%; n=82, 52.6% via phone; n=74, 47.4% via website surveillance; the remainder did not have completed phone calls or website postings within each state's time frame).

Of the 156 with documented activity/status, over half of vape shops were open as usual (53.2%, n=83; 47.6% of phone verified; 60.8% of website verified): 100% in San Diego, 79.2% in Oklahoma City, 76.7% in Seattle, 31.8% in Boston and 21.8% in Minneapolis (table 1). Across the MSAs, 11.5% (n=18) of vape shops were permanently closed, 3.8% (n=18) were temporarily closed and 31.4% (n=49) offered pick-up (26.3%, n=41), home delivery (1.3%, n=2) or both (3.8%, n=6). Notes made by research staff indicated that some vape shop personnel would allow people to come into the store informally. A couple of the vape shops offered 'pop up' hours announced via social media, presumably so consumers could access the store despite mandated temporary closures. Some vape shops reported that they were using their discretion regarding what was safe (assuming their customer volume was not large enough to cause risk) or reported that they were limiting customers entering as needed. A couple of vape shops started selling food (eg, coffee, tea and chips) in order to 'qualify' as an essential business. Several vape shops reported intention to remain open until there were consequences for their activity.

Young adult survey

In this sample ($M_{age} = 23.9$ years, $SD = 4.65$; 46.9% male, 71.8% white, 3.7% black, 13.0% Asian and 13.0% Hispanic), 27.4% worried that their vape shop would close or go out of business during the COVID-19 related shelter-in-place periods, and 7.3% reported that their vape shop did close. Additionally, 22.6% worried other vape product sources would be difficult to access; 12.1% said that other vape product sources were difficult to access. Only 7.3% noticed more options for vape product home delivery; 6.5% more frequently used delivery. Few respondents noticed increases in ads/promotions (4.2%), discounts/price promotions (9.9%) and/or prices (9.3%); only 3.1% noticed decreases in prices. Additionally, 20.3% of respondents stocked

Table 1 VAPES MSAs and data regarding vape shop activity during COVID-19 related non-essential business closures, n=156

MSA, state	Total n (%) [*]	Permanently closed n (%)	Temporarily closed n (%)	Pick-up only n (%)	Home delivery only n (%)	Pick-up/home delivery n (%)	Open as usual n (%)
All MSAs	156 (100.0)	18 (11.5)	6 (3.8)	41 (26.3)	2 (1.3)	6 (3.8)	83 (53.2)
Boston, Massachusetts	22 (14.1)	5 (22.7)	5 (22.7)	4 (18.2)	0	1 (4.5)	7 (31.8)
Minneapolis-St. Paul, Minnesota	55 (35.3)	5 (9.1)	0	33 (60.0)	2 (3.6)	3 (5.5)	12 (21.8)
Oklahoma City, Oklahoma	24 (15.4)	0	0	3 (12.5)	0	2 (8.3)	19 (79.2)
San Diego, California	12 (7.7)	0	0	0	0	0	12 (100.0)
Seattle, Washington	43 (27.6)	8 (18.6)	1 (2.3)	1 (2.3)	0	0	33 (76.7)
Phone verified	82 (52.6)	16 (19.5)	2 (2.4)	22 (26.8)	2 (2.4)	2 (2.4)	38 (46.3)
Website verified	74 (47.4)	2 (2.7)	4 (5.4)	19 (25.7)	0	4 (5.4)	45 (60.8)

This sample of 156 vape shops resided across 86 local jurisdictions (Boston: 11; Minneapolis-St. Paul: 40; Oklahoma City: 9; San Diego: 8; and Seattle: 18).

^{*}Indicates column %; all others are row %. Atlanta, Georgia excluded (see Methods).

MSAs, metropolitan statistical areas; VAPES, Vape shop Advertising, Place characteristics and Effects Surveillance.

up on vape products; however, 20.3% tried to reduce use, and 15.8% attempted to quit.

DISCUSSION

Across five metropolitan areas, approximately half of vape shops followed state non-essential business closure orders. However, a proportion did not comply with state orders, and others exploited ambiguities (eg, pickup/delivery) or circumvented orders using other tactics, for example, promoting ‘pop-up hours’, informal arrangements with patrons, or the addition of food for purchase to qualify as ‘essential’ (without transparency regarding being licenced for food service).²³ Determining whether vape shops were in compliance with closure orders is complicated by ambiguities in non-essential business classifications and potentially contradictory interpretations of state and local policies. We were unable to assess local orders in all 86 jurisdictions represented by the sample of 156 vape shops but determined they were not allowed to be less restrictive than the state orders. There are also concerns about the potential inadequate communication to retailers and local governments about whether vape shops were required to be closed under state orders. Moreover, reallocation of resources by state and local health departments to address COVID-19²⁴ may have reduced their capacity to enforce non-essential business closure orders. Little data are available regarding citations for such non-compliance; however, a 29 May 2020 news report indicated that, of 70 businesses in Los Angeles that were being prosecuted for non-compliance with closure orders, at least 30 were ‘smoke shops’ (including vape shops).²⁵ Results from the current study also underscore the importance of surveillance and enforcement of non-essential business closures.

Survey data from e-cigarette users also indicated that, despite only a small proportion (~7%) indicating that their vape shop closed or went out of business during the closure orders, over a quarter were concerned about reduced access to vape product sources and one-fifth stockpiled vape products. These data raise concern about use frequency and cessation. A

recent mTurk survey of past-month tobacco users found that a fourth reported decreased access to tobacco during COVID-19 but just as many reported increased access.¹⁷ Additionally, only 20% of our sample tried to reduce or quit vaping, whereas prior work found that COVID-19 prompted about a quarter of e-cigarette users to reduce their e-cigarette use, and >20% attempted to quit in order to reduce risk of harm from COVID-19.¹⁷

This study is limited given the aforementioned complexities and ambiguities, as well as broader issues of potential bias in both the vape shop sample and young adult survey, thus limiting generalisability. In particular, the estimates regarding vape shop compliance with state orders should be interpreted with caution, as the status/activity of many vape shops could not be determined because of inability to make contact via phone and/or limited online information. Regardless, findings suggest that vape shop marketing—and the broader vape retail context—requires surveillance during such circumstances as COVID-19 and that further examination of e-cigarette consumers’ perceptions, use behaviours and their experiences with vape retail is needed.

Contributors CB, TOJ, NS, SS, TW and LH created the assessment forms. CB and NS led vape shop data collection. CB led survey data collection. RC and MM led legal research. CB led the writing of the manuscript. All authors contributed to the manuscript writing and reviewed the final manuscript.

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Competing interests None declared.

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What this paper adds

- ▶ COVID-19 state-ordered business closures applied to vape shops in the majority of states.
- ▶ Vape shops showed evidence of non-compliance with COVID-19 state-ordered closures.
- ▶ E-cigarette users were as likely to stockpile vape products as to try to reduce or quit use.

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REFERENCES

- Patanavanich R, Glantz SA. Smoking is associated with COVID-19 progression: a meta-analysis. *Nicotine Tob Res* 2020;22:1653–6.
- Berlin I, Thomas D, Le Faou A-L, et al. COVID-19 and smoking. *Nicotine Tob Res* 2020;22:1650–2.
- Vardavas CI, Nikitara K. COVID-19 and smoking: a systematic review of the evidence. *Tob Induc Dis* 2020;18:20.
- Guan W-J, Ni Z-Y, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med* 2020;382:1708–20.
- Zhang J-J, Dong X, Cao Y-Y, et al. Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China. *Allergy* 2020;75:1730–41.
- Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* 2020;395:1054–62.
- Berg CJ, Barker DC, Meyers C, et al. Exploring the Point-of-Sale among Vape shops across the United States: audits integrating a mystery shopper approach. *Nicotine Tob Res* 2020;26.
- Kampf G, Todt D, Pfaender S, et al. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *J Hosp Infect* 2020;104:246–51.
- van Doremalen N, Bushmaker T, Morris DH, et al. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *N Engl J Med* 2020;382:1564–7.
- Myers ML. Absurd and irresponsible: Vape shops claim they are essential when Vaping may worsen effects of COVID-19 and has addicted millions of kids Washington, DC: campaign for tobacco-free kids, 2020. Available: https://www.tobaccofreekids.org/press-releases/2020_04_15_vape-shops-not-essential
- Soellner M. Vape shop owners want to be considered essential, say it's a matter of public health, 2020. Available: <https://www.postcrescent.com/story/news/2020/04/02/vape-shop-owners-demand-considered-essential-business/5097339002/>
- Sharp J. Is vaping essential? why smoke shops are open during the shutdown: MSN, 2020. Available: <https://www.msn.com/en-us/health/medical/is-vaping-essential-why-smoke-shops-are-open-during-the-shutdown/ar-BB12w2J9>
- Medel D, Meza L, Galimov A, et al. Notes from the field: Vape shop business operations compliance in the wake of COVID-19. *Eval Health Prof* 2020;43:135–7.
- State of California. Exec. order N-33-20 California: state of California, 2020. Available: <https://www.gov.ca.gov/wp-content/uploads/2020/03/3.19.20-attested-EO-N-33-20-COVID-19-HEALTH-ORDER.pdf>
- Hickman A. An analysis of social media and influencer posts found evidence of tobacco companies using #StayAtHome hashtags, creative and giveaways – including branded masks – to market e-cigarettes, vapes and heated tobacco products, 2020. Available: <https://www.prweek.com/article/1683314/big-tobacco-using-covid-19-messaging-influencers-market-products>
- Yach D. Tobacco use patterns in five countries during the COVID-19 Lockdown. *Nicotine Tob Res* 2020;22:1671–2.
- Klemperer EM, West JC, Peasley-Miklus C, et al. Change in tobacco and electronic cigarette use and motivation to quit in response to COVID-19. *Nicotine Tob Res* 2020;22:1662–3.
- Vermont Department of Health. Daily update on novel coronavirus (COVID-19), 2020. Available: <https://www.healthvermont.gov/response/coronavirus-covid-19>; <https://go.aws/34UAK5z> [Accessed 28 Apr 2020].
- United States Census Bureau. *United States census bureau: population*, 2018.
- American Lung Association. *State of tobacco control*. Chicago, Illinois: American Lung Association, 2018.
- Public Health Law Center. U.S. E-cigarette regulations - 50 state review (2019). St. Paul, MN: Public Health Law Center, 2019. Available: <https://publichealthlawcenter.org/resources/us-e-cigarette-regulations-50-state-review>
- Berg CJ, Schleicher NC, Johnson TO, et al. Vape shop identification, density and place characteristics in six metropolitan areas across the US. *Prev Med Rep* 2020;19:101137.
- García R, Sidhu A, Allem J-P, et al. Marketing activities of vape shops across racial/ethnic communities. *Tob Prev Cessat* 2016;2. doi:10.18332/tpc/76398. [Epub ahead of print: 25 Sep 2017].
- Radio W. 230 Tennessee state employees 'repurposed' as coronavirus contact tracers. Tennessee: WMOT Radio, 2020. Available: <https://www.wmot.org/post/230-tennessee-state-employees-repurposed-coronavirus-contact-tracers#stream/0>
- Roosevelt M. *Will small-business owners go to jail for breaking coronavirus rules? We'll find out*. Los Angeles Times, 2020.