

Scoping the vape retail environment and retailers' responses to vape control measures in selected Auckland suburbs with different levels of socio-economic deprivation

Robin van der Sanden, Chris Wilkins, Marta Rychert, Jude Ball, Janet Hoek, Penelope Truman, Geoff Kira, El-Shadan Tautolo

ABSTRACT

AIMS: Emerging research suggests exposure to vape stores and their proximity to schools play a role in vaping initiation among adolescents. In New Zealand, regulatory changes enacted that restrict sales of flavoured vape products to specialist vape retailers (SVRs) have led to growth in “store-within-a-store” (SWAS) SVRs in or beside convenience stores to circumvent restrictions. This paper assesses the number and type of SVR retailers, including SWAS, and their proximity to educational institutes (primary, secondary and tertiary) and marae across Auckland suburbs with different socio-economic deprivation levels.

METHODS: Google Maps data and tools were used to assess SVR “type” and distance from schools, marae and other SVRs in selected Auckland suburbs. One hundred and sixty SVRs were examined across 14 suburbs.

RESULTS: The median number of SVRs per suburb was 9.5. Forty-four percent of SVRs were SWAS. SWAS density increased with socio-economic deprivation, with high-deprivation suburbs containing a median of 8.5 SWAS compared with 2.0 in low-deprivation suburbs. Half of the SVRs (56%) were located within 300m of at least one educational institute.

CONCLUSION: SWAS density in Auckland increased with neighbourhood socio-economic deprivation. SWAS retailers likely contribute to greater exposure to vape retail and products among adolescents in these areas.

In November 2020, New Zealand implemented the *Smokefree Environments and Regulated Products (Vaping) Amendment Act 2020*,¹ which ended vaping product promotions and sales to under-18s. The *Act* restricted the vape product flavours that convenience stores, petrol stations and supermarkets could sell to mint, menthol and tobacco. Only approved specialised vape retailers (SVRs)² could sell other vape product flavours. Two factors underpinned these regulatory changes: firstly, rapid growth in the sales and marketing of unregulated vape products from 2018 onwards^{3,4} and, secondly, growing community concerns about youth vaping.^{5,6} The *Act* sought to extend existing regulations on the sale of “notifiable products”, such as tobacco, to vaping products, hereby using retail restrictions and SVR licenses to curb their visibility and appeal to young people while keeping them accessible to people who smoke.

The SVR application process aims to limit “general retail” of vape products from convenience

stores, supermarkets and petrol stations by ensuring vape retailers operate from an “appropriate premises”.⁷ SVR requirements at the time of writing require stores to operate from a “fixed, permanent” structure, and generate at least 70% of store revenue from the sale of vape products (with some exceptions).⁷ On 21 September 2023, additional SVR regulations were implemented; these no longer allowed new SVR licences to be obtained by retailers located within 300m of a registered school (primary or secondary) or marae.⁸ These regulations do not apply to licences granted to retailers before this date.

Some convenience store retailers responded to the new restrictions on vape retail by constructing separate premises within or adjacent to their store to obtain an SVR licence that allowed the sale of the full range of vape flavours.^{9,10} We term these outlets “store-within-a-store” (SWAS) vape retailers.⁹ Today, SWAS outlets may be found inside, or adjacent to, convenience stores, petrol stations and sometimes also liquor stores. Based on

Ministry of Health data on SVRs as of September 2021, Boston et al. estimated that 14% of SVR applicants were convenience stores.¹⁰ More recently, Ball et al. carried out an in-person audit of all SVRs in the Wellington Region and reported that 47% (N=74) were SWAS.⁹ These findings suggest there may have been significant growth in the number of SWAS SVRs in New Zealand in recent years.

The continued accessibility of appealing vape products from convenience stores and petrol stations via SWAS retailers is notable from a public health standpoint as it may undermine the principal stated objective of the SVR approval scheme: to minimise vaping exposure and harm to children and youth.⁷ A recent qualitative study of underage youth found that social supply and sharing via peers was the primary form of access to vapes.¹¹ However, interviewees also reported sourcing from small, local retail outlets like convenience stores that were known to have lax age verification procedures,¹¹ a practice also documented in the media.¹² Internationally, exposure to vaping products in “small shops”, or local convenience stores, may be linked to increased likelihood of experimenting with vaping or intention to try vaping.¹³

Environmental exposure to vape retailers and youth vaping behaviours

Emerging research suggests environmental exposure to vape product use and advertising, including vape retail density and proximity to schools, may play a role in vaping uptake among adolescents.¹⁴ These associations are consistent with findings from the tobacco¹⁵ and alcohol¹⁶ fields, where environmental exposure to advertising and retail density influence levels of use among young people. Studies have also shown that socio-economic factors may influence vape retailers' location, with a greater density of vape retailers in areas with higher populations of minoritised ethnic groups^{17,18} and higher socio-economic deprivation.¹⁹ In New Zealand, Ball et al. identified clustering of vape stores in high socio-economic deprivation suburbs and fewer stores in low socio-economic deprivation suburbs around the Wellington Region.⁹ Similarly, recent studies conducted in 2023 using spatial mapping to assess vape store density and proximity to schools across New Zealand found a high concentration of vape stores in high socio-economic deprivation areas.^{20,21} Waterman et al.²⁰ found

that in Auckland vape store density was greatest in high socio-economic deprivation areas with larger Māori and Pacific populations. The study authors note that vape retailers' expansion in New Zealand has led to rapid increases in the number of stores in high-deprivation areas, while the number of stores in low-deprivation areas has remained relatively stable.²⁰ Additionally, Payinda et al.²¹ found that, as of June 2023 when the requirements for SVRs to be more than 300m from schools and marae came into effect, 13% of New Zealand primary and secondary schools already had at least one SVR within 300m. They also found that schools in more socio-economically deprived areas were considerably more likely to have SVRs nearby. However, it is not yet known how different “types” of vape retail contribute to environmental exposures to vape products, and whether some types of SVR may play a greater role in increasing environmental exposure to vaping products among teens.

To date, no data have been collected on the number of SWAS SVR established in Auckland. This gap is notable given Auckland is New Zealand's largest and most demographically diverse urban centre. The diversity of Auckland suburbs may provide valuable insights into the concentration and location of SWAS SVRs within different communities and urban centres. This study thus aimed to explore the number and types of SVR across Auckland suburbs with different socio-economic and demographic characteristics. Additionally, we aimed to determine the number of SVRs located within 300m of educational institutes (tertiary, secondary and primary) and marae to investigate levels of current exposure. Lastly, we focussed on the distance between SVRs within the same suburb, applying the same 300m distance measure to examine SVR concentrations across suburbs.

Methods

This study used Google Maps and Google Street View data to identify and assess the number, type and location of SVR in selected Auckland suburbs. Google Maps data, and, in particular, Google Street View, have previously been used to assess compliance with public health measures internationally²² and in New Zealand.^{22,23} In this paper, we extend the use of Google Street View to examine SVR attributes and those of the surrounding area across selected Auckland suburbs.

Suburb selection

The 14 study suburbs were selected using a purposive sampling approach based on the research team's knowledge of key Auckland suburban retail hubs and community characteristics. Suburbs were selected to encompass diversity in socio-economic deprivation, ethnicity and urban density. Table 1 presents the suburbs selected for data collection and their respective socio-economic and demographic attributes based on available 2023 Census population estimates and 2023 New Zealand Index of Deprivation (NZDep) scores. We used census statistical area 2 (SA2) polygons to estimate suburb populations, ethnicity counts and median age by combining the SA2 polygons located within the suburb boundaries visualised on Google Maps. All suburbs are comprised of multiple SA2 polygons (median 8, interquartile range 2–16). It should be noted that Auckland suburbs vary markedly in the number of residents, with Papatoetoe being Auckland's most populous suburb, while Devonport has among the fewest inhabitants.²⁴

Google Maps data collection procedures and SVR classification

A standardised Google Maps and Street View data collection protocol was developed to collect data on SVRs in the selected suburbs. The initial phase of the protocol involved a manual search procedure to identify SVRs visible on Google Maps for a given suburb, as well as educational institutes and marae. Visible locations for each suburb were recorded as screenshots, along with a list of SVR names and addresses.

Once this initial identification phase was completed, data collection for each SVR commenced. Firstly, using Google Maps directions, distances were mapped between each SVR and surrounding schools, marae (if present) and other SVRs to determine whether they were located within 300m of the store. This procedure was completed using the "walking distance" option. Data were recorded by taking screenshots of Google Maps walking route suggestions, ensuring that a distance measurement was visible. Screenshots were added to a folder and overall outcomes (e.g., was the SVR within 300m of any educational institutes? Y/N) were recorded in an Excel spreadsheet.

In addition to Google Maps distance data, photos linked to the SVR's Google Maps profile were examined. We then classified SVRs into three broad categories (i.e., i) upmarket, ii) budget; iii) SWAS) based on store attributes, such as exterior

store front signage, interior furnishings, display layout and product marketing. Table 2 outlines the characteristics of each category. Relevant photos showing each store's interior, exterior and product displays were downloaded. Google Street View was used to check each SVR's location. Google Maps data collection took place from August 2023 to March 2024.

Verification of Google Maps data coverage and accuracy

Google Street View may not be updated for several months at a time and is not available inside shopping malls. To address these limitations, we used several independent data sources for verification.

Google SVR locations were checked against the list of registered SVRs for each suburb maintained by the Health Advisory and Regulatory Platform (HARP) (HARP specialist vape retailers register: <https://vaping.harp.health.nz/search/1DC97E34-E3F1-40E3-ADFE-30092B36F21C>). The Auckland SVR register was downloaded from the HARP website on 14 March 2024 (N=451). This step proved important in locating SWAS SVRs, with many suburbs containing several that were identified only through the HARP registry. In cases where an unknown SVR was identified, Google Maps and Street View were used to match a likely location to the SVR (e.g., a convenience store, or sometimes a liquor store) and the data collection process was then completed for the SVR based on this location. The HARP register also provided the opportunity to update suburb data already collected from Google Maps (e.g., identifying SVRs that had closed since data collection occurred). We verified Google Maps data for SVR proximity to both schools and marae by cross-checking our results with the Ministry of Health's new pre-application proximity assessment tool for prospective specialised vape retailers (Ministry of Health pre-application assessment tool for prospective SVR retailers: <https://experience.arcgis.com/experience/3c09af73f40748e4b84faa3691284f3b>).

We collated data by suburb and recorded SVR attributes in an Excel spreadsheet to facilitate between-suburb comparison. In addition to comparing suburbs, descriptive analyses grouped suburb data by median 2023 NZDep score (see Table 1). We then compared differences in SVR type and location between high and low socio-economic deprivation groups, with the Auckland CBD kept separate as a suburb outlier. This grouping procedure was used to calculate average numbers

Table 1: Selected suburbs and their respective deprivation levels, ethnic make-up and characteristics.

Suburb	Median socio-economic deprivation level (2023 NZDep) ^a	Estimated resident population (2023 NZ Census) ^b	Ethnic make-up of suburb population (2023 NZ Census) ^b	Median age of suburb population (2023 NZ Census) ^b	Suburb characteristics (e.g., residential, CBD)
St Heliers	1	11,439	74% European, 4% Māori, 2% Pacific, 15% Asian, 5% Other	45.6	Residential
Birkenhead	1.5	10,344	68% European, 6% Māori, 5% Pacific, 19% Asian, 4% Other	39.2	Residential
Devonport	1.5	5,079	83% European, 6% Māori, 2% Pacific, 4% Asian, 4% Other	49.4	Residential
Remuera	2	25,458	58% European, 4% Māori, 2% Pacific, 32% Asian, 3% Other	41.1	Residential
Takapuna	3	8,487	63% European, 5% Māori, 2% Pacific, 25% Asian, 5% Other	42.7	Residential/CBD area
Mount Eden	4.5	22,887	56% European, 7% Māori, 5% Pacific, 28% Asian, 5% Other	36.1	Residential
Onehunga	7	17,133	41% European, 12% Māori, 23% Pacific, 19% Asian, 4% Other	34.7	Residential/ industrial
Mount Roskill	7	29,100	25% European, 6% Māori, 15% Pacific, 49% Asian, 5% Other	35.5	Residential
Auckland Central (CBD)	8	31,215	36% European, 7% Māori, 5% Pacific, 45% Asian, 7% Other	32	CBD area
Henderson	8.5	37,675	33% European, 14% Māori, 18% Pacific, 31% Asian, 4% Other	36.5	Residential/CBD area

Table 1 (continued): Selected suburbs and their respective deprivation levels, ethnic make-up and characteristics.

Papakura	9	31,932	27% European, 25% Māori, 20% Pacific, 25% Asian, 2% Other	30.2	Residential/CBD area
Papatoetoe	9	47,910	14% European, 11% Māori, 31% Pacific, 42% Asian, 2% Other	31.8	Residential
Glen Innes	9	9,540	35% European, 16% Māori, 31% Pacific, 14% Asian, 4% Other	31.9	Residential/ industrial
Ōtara	10	21,711	9% European, 18% Māori, 66% Pacific, 6% Asian, 1% Other	27.1	Residential

^aSource: NZDep for 2023 (NZDep2023): <https://www.ehinz.ac.nz/indicators/population-vulnerability/socioeconomic-deprivation-profile/#nzdep-for-2023-nzdep2023>

^bSource: 2023 Census totals by topic for individuals by SA2 part 1 (clipped to coastline): <https://2023census-statsnz.hub.arcgis.com/datasets/StatsNZ::2023-census-totals-by-topic-for-individuals-by-sa2/about?layer=0>

Table 2: Classification of different types of SVR and their respective attributes.

Category name	SVR attributes and characteristics	Examples of each category
Upmarket	<p>“Boutique” store layout (e.g., wood furnishings, curated product displays, vape recycling initiatives, indoor plants).</p> <p>May incorporate a more “open” store layout and product display (e.g., products not kept behind glass), with a small counter for payments.</p> <p>Most do not sell bongs, hookah or other smoking paraphernalia.</p> <p>May have more heavily stylised branded store displays or, alternatively, may be a branded store.</p>	<p>Examples of upmarket stores:</p> <ul style="list-style-type: none"> • VAPO • Cosmic • Vape Merchant <p>Heavily branded upmarket stores:</p> <ul style="list-style-type: none"> • IQOS • Podlyfe • 313 by Airscream
Budget	<p>A standardised retail store layout.</p> <p>Typically involves basic store layout with products displayed in glass cases, often lit with LEDs, and behind glass counters (e.g., most products cannot be picked up without first asking the store attendant).</p> <p>Often more minimally branded (e.g., a poster on the wall, or a standard alt. brand product display case).</p> <p>Most sell other smoking-related products (e.g., shisha, bongs, rolling papers, etc.).</p>	<p>Examples of budget SVRs:</p> <ul style="list-style-type: none"> • Shosha • MyBlitz • Vape Haven • The Vape Shed

Table 2 (continued): Classification of different types of SVR and their respective attributes.

“Store-within-a-store” (SWAS)	Located inside or attached to convenience stores, petrol stations or liquor stores. Store is constructed to provide nominal impression of being a separate premises from the main shop. Small store size. Minimally branded.	
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of SVR types and stores within 300m of educational institutes, marae and other vape retailers. This paper presents the results of this cross-suburb Google Maps scoping procedure and subsequent descriptive analysis.

Results

Differences in number and type of SVRs across suburbs

Table 3 presents an overview of the demographics and SVR data per 1,000 population for each suburb scoped. A total of 160 SVRs were identified, of which 44% were SWAS outlets (n=70), 42% budget (n=67), 10% (n=16) upmarket and 4% (n=7) were of unknown store type.

The overall median number of SVRs per suburb was 9.5, comprising 4.5 SWAS, 3.5 budget and 0.5 upmarket SVRs, and 0 SVRs of unknown store type. The Auckland City CBD had by far the highest total number of SVRs (n=43), followed by Henderson (22), Papakura (17), Papatoetoe (13), Ōtara (13) and Mount Roskill (11). In contrast, St Heliers had no SVRs.

The density of SVRs per 1,000 suburb residents was greatest in the Auckland CBD area (1.38) followed by high socio-economic deprivation residential/industrial suburb Glen Innes (0.74), residential/CBD area Takapuna (0.71) and high-deprivation residential suburb Ōtara (0.60). SVR density was lowest in low socio-economic deprivation residential suburbs St Heliers (0.00) and Remuera (0.12), and in the high socio-economic deprivation residential suburb Papatoetoe (0.27).

Figure 1 summarises the median number of SVRs (total and subtype) by suburb socio-economic deprivation level (1=lowest socio-economic deprivation; 10=highest socio-economic deprivation). The median number of budget SVRs was highest in the mid-high socio-economic deprivation group (6). The number of SWAS SVRs increased with the

socio-economic deprivation status of the suburb. For example, the low socio-economic deprivation group (decile <=2) had a median of only 2.0 SWAS SVRs compared to the high socio-economic deprivation suburbs (decile >=9) with a median of 8.5.

Proximity to sensitive sites and other SVRs

Fifty-six percent of SVRs in the sample were located within 300m of at least one educational institute (tertiary, secondary or primary), 10% were located within 300m of a marae (noting that only a minority of suburbs had any marae) and 66% were located within 300m of at least one other SVR.

In the Auckland CBD, 81% of SVRs (n=35) were located within 300m of an educational institute (86% within 300m of a tertiary institute; 14% secondary; and 0% primary), while 68% (n=15) of SVRs in Henderson were located within 300m of educational institutes that were mostly primary or secondary schools (20% tertiary; 60% secondary; and 40% primary).

Suburbs in the medium-high socio-economic deprivation group (median NZDep Index score of more than 5.5 and less than 9) contained a median of 7.0 SVRs located within 300m of an educational institute (Figure 2). Suburbs in the highest socio-economic deprivation (≥ 9) group contained a median of 4.0 SVRs within 300m of an educational institute. The medium-high, high and low-medium socio-economic deprivation suburbs also had the greatest median number of SVRs located within 300m of another SVR (medium-high deprivation group=7.0; high deprivation group=6.0; low-medium deprivation group=6). In contrast, a suburb in the lowest socio-economic deprivation group (≤ 2) contained a median of only 2.0 SVRs located within 300m of an educational institute, and only 2.0 SVRs located within 300m of another SVR.

Figure 1: Median number of specialist vape retailers (SVRs) (all types) and SVRs of different “types” by sampled suburb socio-economic deprivation level. Auckland CBD not included.

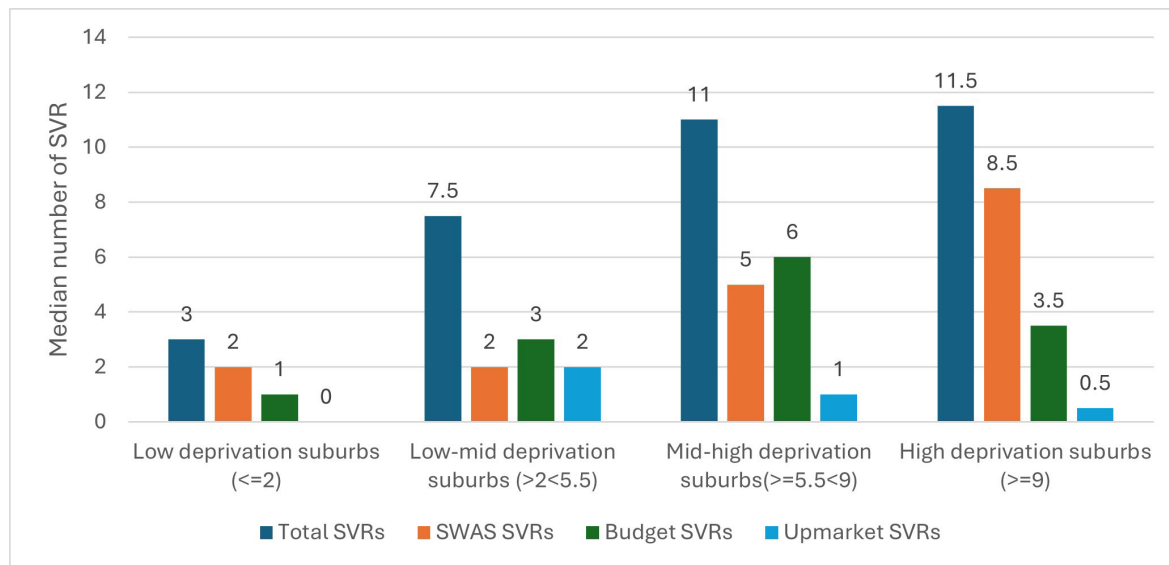


Figure 2: The median number of specialist vape retailers (SVRs) within 300m of each location by socio-economic deprivation level.

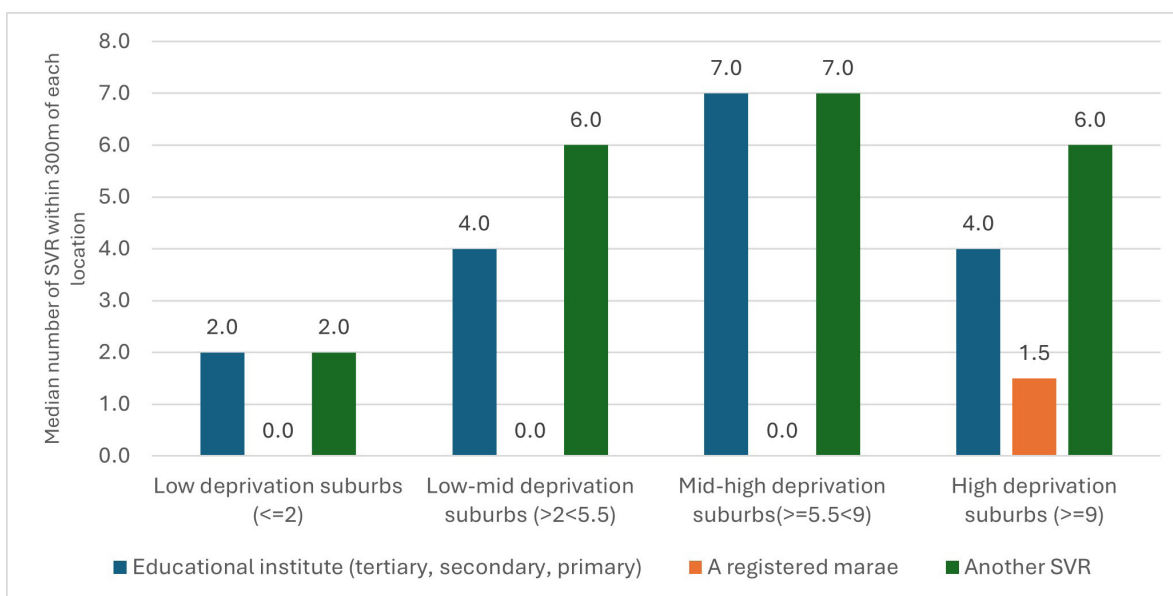


Table 3: Demographics and specialist vape retailer (SVR) composition of scoped Auckland suburbs. Auckland CBD is shaded as a suburb outlier.

	Median 2023 NZDep (SA2) ^a	Estimated suburb resident population (2023 NZ Census, SA2) ^b	% Māori population (2023 NZ Census, SA2) ^b	% Pacific population (2023 NZ Census, SA2) ^b	Total number of SVRs	Upmarket SVRs	Budget SVRs	SWAS SVRs	Unknown store type	Average number of SVRs per 1,000 suburb residents
St Heliers	1	11,439	4%	2%	0	-	-	-		0.00
Birkenhead	1.5	10,344	6%	5%	3	0	1	2		0.29
Devonport	1.5	5,079	6%	2%	3	0	1	2		0.59
Remuera	2	25,458	4%	2%	3	0	1	2		0.12
Takapuna	3	8,487	5%	2%	6	2	2	1	1	0.71
Mount Eden	4.5	22,887	7%	5%	9	2	4	3		0.39
Onehunga	7	17,133	12%	23%	10	1	4	5		0.58
Mount Roskill	7	29,100	6%	15%	11	0	6	5		0.38
Auckland CBD	8	31,215	7%	5%	43	6	22	11	4	1.38
Henderson	8.5	37,675	14%	18%	22	2	10	9	1	0.58
Papatoetoe	9	47,910	11%	31%	13	0	3	9	1	0.27
Papakura	9	31,932	25%	20%	17	2	6	9		0.53
Glen Innes	9	9,540	16%	31%	7	0	3	4		0.74
Ōtara	10	21,711	18%	66%	13	1	4	8		0.60
Totals	7	315,286	13%	22%	160	16	67	70	7	0.51

^aSource: NZDep for 2023 (NZDep2023): <https://www.ehinz.ac.nz/indicators/population-vulnerability/socioeconomic-deprivation-profile/#nzdep-for-2023-nzdep2023>

^bSource: 2023 Census totals by topic for individuals by SA2: <https://2023census-statsnz.hub.arcgis.com/maps/StatsNZ::2023-census-totals-by-topic-for-individuals-by-sa2/about>

Discussion

This paper explored the socio-economic and demographic patterning of vape retailers across selected Auckland suburbs, with a focus on scoping the distribution of SWAS retailers, which emerged as an unintended retail industry response to New Zealand vaping regulation changes in 2020. Our findings contribute to the growing evidence of vape retail location and density as an emerging form of health inequity in New Zealand^{20,21} by providing insight into different types of retail outlets and their placement in suburbs with different socio-economic characteristics.

Consistent with other recent New Zealand studies,^{9,20,21} we found higher median numbers of SVRs in high socio-economic deprivation areas, which often had a high proportion of Māori and Pacific residents. Among our sampled suburbs, greater density of SVRs in high socio-economic deprivation areas was linked to a greater number of SWAS SVR outlets compared to suburbs with lower socio-economic deprivation levels. Almost half of the SVRs examined in our Auckland study (44%; N=160) were SWAS SVRs. This is very similar to Ball et al.,⁹ who found 47% of Wellington SVRs (N=74) were SWAS outlets. While our findings show budget and upmarket SVRs tend to be concentrated in suburbs with distinct commercial areas (e.g., Auckland CBD, Takapuna, Henderson, Papakura), SWAS SVRs were predominantly found in residential areas. Furthermore, their association with convenience stores is likely to mean that children and teens are routinely exposed to vaping products, which often feature appealing product packaging. Among our sampled suburbs, the potential for youth exposure to vape products posed by SWAS SVRs fell largely on those populations already facing the greatest health inequities.

Notably, rates of daily and regular youth vaping remain considerably higher among Māori and Pacific youth compared with youth of other ethnicities.^{25,26} Greater density of SVR outlets in areas with large Māori and Pacific populations^{20,21} may be an important factor in maintaining higher youth vaping rates among these groups. However, our findings show how attributes of the vape retail environment, particularly greater numbers of SWAS retailers, may also increase youth exposure to vaping products. Therefore, a focus on reducing SWAS retail outlets may be effective at reducing youth vaping uptake among Māori and Pacific young people.

Our findings suggest addressing the unintended

SWAS retail outlets should be a priority area for policymakers. Current Health New Zealand – Te Whatu Ora (Ministry of Health) guidelines for prospective specialised vape retailers require applicants to submit photos and floorplans of prospective store locations to determine whether they are an appropriate vaping premises (AVP).⁷ This information could be used to assess whether the proposed AVP falls within the footprint of another store (i.e., is a SWAS). Consequently, a possible response is to require current SVR applicants to submit additional photographic evidence of store surroundings to prove the premises are not operating in a space within or adjacent to existing convenience stores, petrol stations or liquor stores. This process could be applied retrospectively to existing SVR outlets to remove SWAS retailers.

The concentration of SVRs in high-deprivation suburbs in Auckland may warrant further regulatory responses that better balance the needs of predominately adults to access vaping products as a means to stop smoking with limiting vape products to young people who have never smoked. The recently announced *Auckland Local Alcohol Policy (ALAP)* has signalled tougher restrictions on the opening of new alcohol off-licences across 23 “priority areas” in Auckland, focussing on high-deprivation suburbs.²⁷ The new provisions include a 2-year freeze on the granting of new liquor licenses in these areas.²⁸ It may be useful to consider a similar cap and “sinking lid policy” to reduce the number of SVR licences in high socio-economic deprivation Auckland suburbs over time. This could be accomplished without impacting general retail of tobacco-, mint- and menthol-flavoured vape products in convenience stores, petrol stations and supermarkets to ensure vaping products remain accessible to smokers. We note that the number of general retailers operating in Auckland and the wider country at large who sell vape products is currently unknown. As such, the role general retailers may play in the continued accessibility of vaping products to young people remains unclear.

Importantly, in June 2025 additional regulatory requirements for SVRs and online vape retailers came into effect. Regulatory changes disallow the sale of disposable vapes and greatly curtail the visibility and marketing of vaping products by both online and physical vape retailers. These changes also increase penalties for retailers selling vaping products to minors, and do not allow new SVRs to open within 100m of early childcare

centres.²⁹ Our findings suggest that removing the unintended SWAS vape retail model is another approach to reduce youth exposure to vaping products.

Limitations

This study has limitations that should be taken account when interpreting the findings. Firstly, our findings are based on a select number of key Auckland suburbs, which may not be wholly representative of the wider Auckland Region. Secondly, our findings reflect the SVR environment in each suburb between August 2023 and March 2024, thus do not capture more recent regulatory changes and their related impacts over time. Additionally, though we used the most recent population data sources at the time of writing, the populations of many Auckland suburbs have increased since the 2023 Census period,²⁴ which may mean SVR store densities relative to suburb populations have declined. Thirdly, the availability of Google Maps data and the recency of Google Street View images varied across SVR locations and suburbs in this study. The SVR count by suburb and the proximity of SVR locations to schools and marae were all checked against available third-party data sources and our dataset updated as required. Finally, the rapid expansion of SVRs in New Zealand in the last few years means that some locations had opened too recently to be verified via Google Maps or Street View, given these tools are updated only periodically. For this

reason, some of the SVRs are listed as “unknown store type” in Table 3.

Conclusion

Scoping of the number, type and density of SVRs across Auckland suburbs with diverse socio-demographic characteristics suggests the number and density of SVRs increase as deprivation level increases. Furthermore, this association was particularly strong in the case for SWAS SVRs located inside or adjacent to convenience stores, petrol stations and sometimes liquor stores, which were much more likely to be located in high socio-economic deprivation suburbs with large populations of Māori and Pacific people. SWAS SVRs are more likely to be located in residential rather CBD areas, and the high number associated with convenience stores increases the likelihood that youth in these areas will have higher exposure to vape products with appealing packaging and product names. A possibly response to the SWAS, which was developed by the retail sector as a response to new retail vape restrictions, is to remove them by requiring photographic evidence from current SVR licence holders of their proximity to convenience stores. This would be an important step in striking the balance between the need to reduce youth exposure to vaping products while ensuring vape products remain accessible as an alternative to smoking tobacco.

COMPETING INTERESTS

This study was funded by a grant from Health Research Council New Zealand (grant number: HRC22/245).

JB has received consulting fees from the Ministry of Social Development, The University of Auckland and the Government of South Australia. JB is secretary of the Public Health Association, Wellington branch, and a member of the Smokefree Expert Advisory Group, Health Coalition Aotearoa.

JH has received: ITC programme advisory fees; funding from the Japan Tobacco Society to present to the 2022 conference; small gifts (e.g., book vouchers) for speaking at conferences; funding from the Thoracic Society of Australia and New Zealand to present to a conference in 2023 (Singapore) and 2025 (Adelaide); funding from La Fondation Contre le Cancer to present in Brussels, 2025; and funding from UniSante to present in Lausanne, 2025. JH has had travel and accommodation paid to attend the IASLC meeting in Singapore 2023. JH is a co-director of ASPIRE Aotearoa; a member of the Health Coalition Aotearoa Smokefree Expert Advisory group and various Australian health advisory groups; a senior editor, *Tobacco Control*; a co-opted member of the Public Health Advisory Committee, Health Research Council; and a member of the Ministry of Health Smokefree Advisory Committee.

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