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Identifying tobacco retailers in the absence of a licensing system: lessons from Australia

John Baker ¹, Mohd Masood,^{2,3} Muhammad Aziz Rahman,^{4,5} Lukar Thornton,⁶ Stephen Begg¹

¹Rural Department of Community Health, La Trobe Rural Health School, Flora Hill, Victoria, Australia

²Department of Dentistry and Oral Health, La Trobe Rural Health School, Bendigo, Victoria, Australia

³Department of Community Dentistry, Dental Institute, University of Turku, Turku, Finland

⁴School of Health, Federation University Australia, Berwick, Victoria, Australia

⁵Australian Institute of Primary Care and Ageing (AIPCA), La Trobe University, Melbourne, Victoria, Australia

⁶School of Exercise and Nutrition Sciences, Deakin University Institute for Physical Activity and Nutrition, Burwood, Victoria, Australia

Correspondence to

Mr John Baker, Rural Department of Community Health, La Trobe Rural Health School, Flora Hill, VIC 3550, Australia; J.Baker@latrobe.edu.au

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ABSTRACT

Objectives To estimate the proportion of retailers that sell tobacco in the absence of appropriate local government oversight, and to describe the characteristics by which they differ from those that can expect to receive such oversight.

Methods A database of listed tobacco retailers was obtained from a regional Victorian local government. Potential unlisted tobacco retailers were added using online searches, and attempts to visit all retailers were undertaken. GPS coordinates and sales type information of retailers that sold tobacco were recorded and attached to neighbourhood-level data on socioeconomic disadvantage and smoking prevalence using ArcMap. Logistic regression analyses, χ^2 tests and t-tests were undertaken to explore differences in numbers of listed and unlisted retailers by business and neighbourhood-level characteristics.

Results Of 125 confirmed tobacco retailers, 43.2% were trading potentially without government oversight. Significant differences were found between listed and unlisted retailers by primary business type ($p<0.001$), and sales type ($p<0.001$) but not by the other characteristics.

Conclusions The database of tobacco retailers was inaccurate in two ways: (1) a number of listed retailers no longer operated or sold tobacco, and (2) 43.2% of businesses confirmed as selling tobacco were missing. As no form of licensing system exists in Victoria, it is difficult to identify the number of retailers operating, or to determine how many receive formal regulatory oversight. A positive licensing system is recommended to regulate the sale of tobacco and to generate a comprehensive database of retailers, similar to that which exists for food registration, gaming and liquor-licensed premises.

INTRODUCTION

Australia has been at the forefront of tobacco control initiatives since the 1970s, however smoking is still a leading cause of preventable mortality and nearly 19 000 Australians are killed by tobacco use each year.¹ Tobacco consumption is responsible for 9.0% of the total burden of disease in Australia.¹

Responsibility for tobacco legislation and enforcement in Australia is shared between national, state/territory and local levels of government. Tobacco retailers in all states and territories are required to comply with basic legislation such as preventing sales to minors, displaying warning signage, point-of-sale (PoS) display bans and advertising restrictions.² Tobacco products were sold by an estimated 29 907 to 40 000 retailers throughout the country in 2014, however not all jurisdictions

have a licensing or registration system in place for tobacco retailers.^{3–8} Tobacco retailer licensing systems can be used to facilitate compliance with tobacco-related legislation, to regulate the number of retailers, to prevent underage sales and to reduce tobacco availability in lower socioeconomic (SES) neighbourhoods and near schools.^{9 10}

Historically, the state of Victoria has been at the forefront of tobacco control legislation,¹¹ however in recent years it has fallen behind other Australian states and territories in key policy areas. For example, Queensland introduced smoke-free outdoor dining areas in 2006, while Victoria did not implement similar legislation until more than a decade later.¹² Similarly, Victoria is one of only two jurisdictions to have stopped short of implementing a licensing system for tobacco retailers.¹³ The lack of any form of licensing or registration system for the sale of tobacco is likely to be undermining effective policing of the 8000 tobacco retailers that are estimated to be operating in this state.¹⁴

Previous studies have described the effects of different licensing systems in other states and territories.^{9 15 16} New South Wales has a 'negative' licensing system, whereby retailers are only required to register on a one-off basis without a fee. Research in New South Wales identified one unlisted retailer for every 12.6 listed retailers, and found that unlisted retailers were more likely to breach in-store PoS legislation.¹⁶ In contrast, positive licensing systems, where retailers are required to register and pay an annual fee, provide a comprehensive list of retailers which can be used by authorities to facilitate education visits and enforcement to improve compliance.^{15 16} No research to date has examined the consequences of Victoria's failure to regulate the licensing of tobacco retailers. The present study is the first to address this gap in knowledge by describing the proportion of retailers that sell tobacco products in the absence of appropriate local government oversight and the characteristics by which they differ from those that can expect to receive such oversight.

METHODS

The setting was a regional Local Government Area (LGA) of Victoria where there are generally higher rates of socioeconomic disadvantage relative to the rest of the state and smoking rates are higher than the state average, particularly among adolescents. At the request of this LGA, it will be referred to in this study as 'Local Government X'. Local Government X covers a geographically large regional area (>2800 km²). It comprises one large town and



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several smaller towns throughout the municipality, however those mandated to inspect tobacco retailers (environmental health officers (EHOs)) only operate from municipal offices located within the large town.

An existing database of listed tobacco retailers (updated in April 2018) known to Local Government X was obtained using a Freedom of Information request after sensitive or personal information and enforcement-related information had been redacted. Duplicate listings were removed and a list of potential business types (eg, petrol stations, supermarkets, milk bars, general stores, news agencies, tobacconists, gift shops, barbers, delis, cafés, diners, accommodation, licensed liquor premises) to target using an internet-based search strategy was developed on the basis of information from the database and local knowledge. Internet searches were undertaken on a suburb-by-suburb basis between May and August 2019 using Google (examples of search terms: 'Petrol stations in (*name of town*)', 'Pubs in (*name of suburb*)') to identify additional businesses that might potentially sell tobacco within the municipality. Google Maps (including Street View) and social media (ie, Facebook, Instagram and Twitter) were used to establish whether these businesses were likely to be still operating. Potential retailers identified using these methods were added to the list of retailers known to Local Government X to comprise a list of businesses to be verified with a site visit. Business addresses were confirmed in Google Maps and up to three visits per business address were attempted between June and August 2019 by the primary researcher posing as a potential customer. If the business was open, a determination was made using either visual cues (eg, observing signage such as a price board, a cigarette gantry or working vending machine) or verbal confirmation (eg, asking the sales assistant) as to whether the business currently sold tobacco. For businesses that only opened seasonally, were geographically distant, or only operated at night, verbal confirmation via telephone was attempted. Other businesses identified by the researcher in the field that matched the targeted business types but that had not been previously identified through other methods were also visited and a determination was made as to whether tobacco was sold.

The coordinates of each physical business premise in which it had been confirmed that tobacco was available for purchase by the general public were recorded at the site visit and then geocoded and verified in ArcMap. Telephone or internet-based businesses, home-delivery businesses and wholesalers were excluded, as it was not possible to determine how many of these were operating and which suburbs they delivered to throughout the LGA. Each confirmed retailer was then coded according to the following attributes: primary business type (petrol station, pub, takeaway liquor outlet, supermarket, milk bar or general store, news agency, tobacconist, gift shop or barber, deli, café or diner or accommodation), presence of a vending machine (yes, no), straight-line distance from the central municipal offices (in kms) and the following neighbourhood-level variables: SES, smoking prevalence and the proportion of the population under 20 years of age. Primary business type and presence of a vending machine were determined at the site visit. Straight-line distance from the central municipal offices to the business address was derived in ArcMap and was included to explore whether Local Government X EHOs were more likely to include in their database tobacco retailers that were geographically closer to the municipal offices.

Neighbourhood-level socioeconomic status was based on the 2016 ABS Index of Relative Socio-Economic Disadvantage¹⁷ score of the Statistical Area Level 1 (SA1) within which the business was located. A low score indicates a high level of

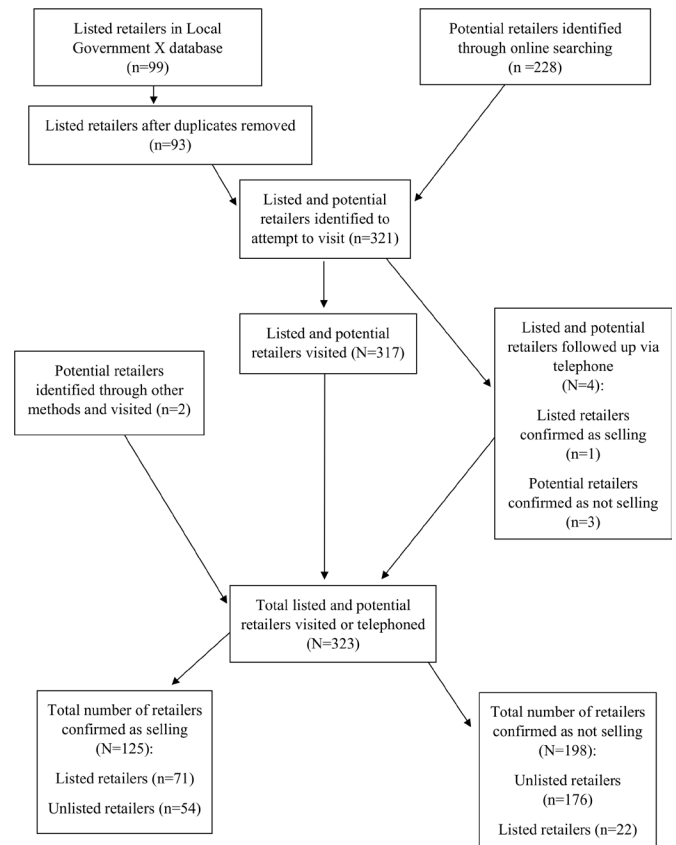


Figure 1 Tobacco retailer identification flow chart.

disadvantage, and a high score indicates a low level of disadvantage. Neighbourhood-level smoking prevalence was obtained from a community survey conducted in 2019 by Local Government X. Only respondents who provided their suburb of residence, age and smoking behaviour were included (n=10043). Responses to the smoking behaviour question were weighted using the sampling weight variable as recommended by the data custodians to provide accurate prevalence estimates at the suburb level. Respondents aged 18 years and over were asked whether they were a current smoker, an ex-smoker or a never smoker. Suburb-level smoking prevalence was derived from the proportion of respondents who answered that they currently smoked. One retailer was located in a suburb that did not receive any responses to the community survey and was therefore excluded from multivariate analyses. Neighbourhood-level estimates of the proportion of the population under 20 years of age were based on population counts at the SA1 level from the 2016 census.¹⁸

Differences in the numbers of listed and unlisted tobacco retailers across these attributes were explored using χ^2 statistics, t-tests and logistic regression in Stata. A penalised maximum likelihood estimation developed by Firth was used instead of ordinary logistic regression because of its ability to cope with potentially separated datasets (ie, datasets in which a variable perfectly predicts every outcome in the sample).¹⁹

RESULTS

In total, 99 retailers were listed in the original database provided by Local Government X. After duplicate listings were removed, 93 retailers remained (figure 1). A further 228 potential retailers were identified through online searches. In total, 323 retailers were identified to visit. Four of these retailers were subsequently

Table 1 Listed and unlisted tobacco retailers by selected characteristics

	Listed	Unlisted	Total	P value*
Total	71	54	125	
Primary business type, n (%)				<0.01
Petrol station	29 (40.8)	2 (3.7)	31 (24.8)	
Pub	0 (0)	24 (44.4)	24 (19.2)	
Takeaway liquor outlet	0 (0)	24 (44.4)	24 (19.2)	
Supermarket	17 (23.9)	0 (0)	17 (13.6)	
Milk bar/General store	11 (15.5)	0 (0)	11 (8.8)	
News agency	6 (8.5)	1 (1.9)	7 (5.6)	
Tobacconist/Gift shop/Barber	3 (4.2)	3 (5.6)	6 (4.8)	
Deli/Café/Diner	3 (4.2)	0 (0)	3 (2.4)	
Accommodation	2 (2.8)	0 (0)	2 (1.6)	
Vending machine present, n (%)				<0.01
No	71 (100)	38 (70.4)	109 (87.2)	
Yes	0 (0)	16 (29.6)	16 (12.8)	
IRSED† score, mean±SD	950.7±82.2	949.4±72	950.1±77.6	0.93
Distance from municipal offices (km)‡, mean±SD	11±15.2	7.1±11	9.3±13.6	0.12
Proportion current smokers (%)§, mean±SD	11.3±4.8	10.9±4.3	11.1±4.6	0.68
Proportion of population under 20 (%)†, mean±SD	22.8±5.8	21.5±5.5	22.2±5.7	0.22

* χ^2 statistic for categorical variables or t-test for continuous variables.
†Based on SA1 of each retailer. One listed retailer was located in an SA1 without an IRSED score or resident population.
‡Straight-line distance.
§Based on suburb of each retailer. One listed retailer was located in a suburb that did not receive any responses to the community survey.
IRSED, Index of Relative Socio-Economic Disadvantage; SA1, Statistical Area Level 1.

telephoned by the researcher to determine whether tobacco was sold, and two potential retailers were identified during field visits to other retailers.

Of the 93 unique tobacco retailers in the original database provided by Local Government X, 9 had closed and 13 no longer sold tobacco (n=22, 23.6% in total), leaving 71 businesses selling tobacco products with apparent oversight from local authorities. An additional 54 unlisted tobacco retailers were identified through a combination of internet searching and site visits, resulting in a total of 125 confirmed tobacco retailers in the municipality, 43.2% of which were trading potentially without such oversight.

Chi-squared statistics revealed significant differences in the numbers of listed and unlisted retailers by business type ($p < 0.001$) and presence of a vending machine ($p < 0.001$, table 1). All supermarkets (n=17), milk bars or general stores (n=11), delis, cafés or diners (n=3) and accommodation providers (n=2) that sold tobacco were known to Local Government X, while none of the takeaway liquor outlets (n=24) or pubs (n=24) were included in the original database (table 1). Similarly, none of the businesses with a vending machine (n=16) were included in the original database, and all but one of these was a pub. No other attribute

in the analysis distinguished between listed and unlisted retailers in a significant way (table 1).

Without adjusting for covariates, pubs (crude OR 578.20, 95% CI 26.49 to 12 621.84), takeaway liquor outlets (crude OR 578.20, 95% CI 26.49 to 12 621.84) and tobacconists, gift shops or barbers (crude OR 11.80, 95% CI 1.65 to 84.21) were significantly more likely than petrol stations to be unlisted (table 2). Retailers with a vending machine were also significantly more likely to be unlisted (crude OR 61.29, 95% CI 3.58 to 1049.63) compared with those without. No other variable in the bivariate analyses distinguished between listed and unlisted retailers in a significant way (table 2).

When taking into account the included covariates, pubs (adjusted OR 157.46, 95% CI 05.52 to 4489.02), takeaway liquor outlets (adjusted OR 511.64, 95% CI 20.60 to 12 709.55) and tobacconists, gift shops or barbers (adjusted OR 13.05, 95% CI 1.54 to 110.72) were still significantly more likely than petrol stations to be unlisted, however vending machine presence and the likelihood of being unlisted was no longer significant. This was because all 16 of the retailers with vending machines were liquor-licensed premises. No other variable in the multivariate

Table 2 ORs of unlisted tobacco retailers

	OR for being unlisted (vs listed)	
	Crude OR (95% CI)	Adjusted OR (95% CI)
Primary business type		
Petrol station	Ref.	Ref.
Pub	578.20 (26.49 to 12 621.84)	157.46 (05.52 to 4489.02)
Takeaway liquor outlet	578.20 (26.49 to 12 621.84)	511.64 (20.60 to 12 709.55)
Supermarket	0.34 (0.02 to 7.43)	0.36 (0.02 to 7.55)
Milk bar/General store	0.51 (0.02 to 11.52)	0.56 (0.02 to 12.70)
News agency	2.72 (0.30 to 24.46)	2.50 (0.27 to 23.32)
Tobacconist/Gift shop/Barber	11.80 (1.65 to 84.21)	13.05 (1.54 to 110.72)
Deli/Café/Diner	1.69 (0.07 to 42.71)	2.97 (0.07 to 121.19)
Accommodation	2.36 (0.09 to 63.95)	1.32 (0.01 to 137.20)
P value	<0.001	<0.001
Vending machine present	61.29 (3.58 to 1049.63)	1.97 (0.03 to 133.63)
P value	0.005	0.752
IRSED score*	1.00 (1.00 to 1.00)†	1.00 (0.99 to 1.01)
P value	0.922	0.969
Distance from municipal offices (km)‡	0.98 (0.95 to 1.01)	1.03 (0.97 to 1.08)
P value	0.143	0.345
Proportion current smokers (%)§	0.98 (0.91 to 1.06)	0.99 (0.77 to 1.28)
P value	0.681	0.939
Proportion of population under 20 (%)*	0.96 (0.90 to 1.03)	1.02 (0.83 to 1.26)
P value	0.233	0.841

*Based on SA1 of each retailer. One listed retailer was located in an SA1 without an IRSED score or a resident population.

†CI without rounding (0.995 to 1.004).

‡Straight-line distance.

§Based on suburb of each retailer. One listed retailer was located in a suburb that did not receive any responses to the community survey.

IRSED, Index of Relative Socio-Economic Disadvantage; SA1, Statistical Area Level 1.

analyses distinguished between listed and unlisted retailers in a significant way (table 2).

DISCUSSION

This study found that an existing database of tobacco retailers from a regional local government in Victoria with relatively high smoking rates was inaccurate in two ways. First, 23.6% of listed retailers no longer operated or sold tobacco. Second, 43.2% of businesses confirmed as currently selling tobacco were missing from this database. This is equivalent to one unlisted retailer for every 1.3 listed retailers. As no form of tobacco retailer licensing system is in place in Victoria, this problem is likely to be common to many municipalities across the state, making it difficult to accurately identify the number of retailers operating, or to determine how many retailers are receiving proper oversight by local authorities.

Recent research in New South Wales, where a negative licensing system is in place, identified one unlisted tobacco retailer for every 12.6 registered retailers (7.93%).¹⁶ While the current study was unable to look at adherence to tobacco retail legislation, the New South Wales study found that tobacco retailers in more disadvantaged areas were more likely to be in breach of in-store regulations than those operating in less disadvantaged areas, and that unlisted retailers are less likely to comply with tobacco retailer legislation. It is possible, therefore, that many of the unlisted retailers identified in the present study are in breach of these regulations as well.¹⁶

A key finding of the current study was that certain business types (ie, pubs and takeaway liquor outlets) were not in the original tobacco retailer database maintained by Local Government X and obtained through a Freedom of Information request. It is likely that most of these businesses are known to local or state authorities through other regulatory mechanisms (eg, food inspections or liquor and/or gaming audits). However, Local Government X advised that it gives highest priority to compliance with food handling practices when visiting these premises because of the immediate risks to public health in the event of a foodborne outbreak, and that tobacco-specific education is given much less of a priority due to time and funding constraints.

Local Government X also explained that the absence of liquor-licensed premises in the original database is because liquor-licensing legislation does not allow for minors to visit such businesses unaccompanied by a responsible adult. In their view, this limits the type of premises in which they can reliably undertake underage test-purchasing for tobacco products, as the presence of an EHO (as the 'responsible adult') while the minor attempts a test-purchase at a liquor-licensed premises could contaminate the result. Greater coordination between those in Victoria mandated to enforce tobacco legislation compliance (ie, EHOs and state health authorities) and those charged with enforcing liquor and gaming laws (ie, state gaming and liquor authorities and the police) to allow for underage test-purchasing of tobacco products in liquor-licensed premises might be one way to overcome such constraints (perceived or otherwise). Another might be not to involve minors in test-purchasing at liquor-licensed premises. An Australian study in the related field of alcohol research, for example, found that despite legislation prohibiting the sale of alcohol to minors, 60% of adult participants perceived by a panel of professionals to look under the minimum purchasing age of 18 years ('confederate-purchasers') were nevertheless able to purchase liquor from takeaway liquor outlets.²⁰ Such an approach to the test-purchasing of tobacco in Victorian liquor-licensed premises would remove any

requirement for test-purchasers to be accompanied by another person.

There is a large body of research in Australia and elsewhere to suggest that the introduction of a licensing system for tobacco retailers in Victoria could improve retailer compliance with tobacco legislation and reduce sales to minors.^{9 10 21} First, it would result in a much more accurate record of tobacco retailers (including retailers with multiple points-of-sale)²² than currently exists and, if coupled with an appropriate licensing fee, a more sustainable funding stream for local governments to undertake regular education visits, compliance checks and underage test purchasing.²² More importantly, however, it may also influence the number of tobacco retailers and points-of-sale within retailers. Research in South Australia, for example, observed a 27% decrease in the number of tobacco retailers renewing their licences between 2007 and 2009 when the cost of a licence increased from \$A12.90 to \$A200.00.⁹ One option would be to set licence fees using a sliding scale based on the number of employees or the annual turnover of each business. Certain business types, such as supermarkets, would therefore have the highest licensing fees, as these business types made up approximately 55% of all tobacco sales in Australia in 2017.²³ However, the constitutional validity of such an approach needs to be investigated further.

Currently, New South Wales, Western Australia and the Australian Capital Territory are the only jurisdictions in Australia that provide publicly searchable databases of tobacco retailers.²⁴⁻²⁶ If other states and territories were to follow suit, this would provide a more accurate picture of the tobacco retailing landscape in this country and allow researchers and governments to determine where further research or policy development is needed. Victoria already has a publicly available database for gaming and liquor-licensed premises, which can be searched by licence type and location using interactive maps.²⁷ A similar tool for tobacco retailers would greatly assist tobacco control in the state.

In Victoria, liquor retailers, gaming operators and those selling food must register or apply for a licence and pay an application fee as well as an annual renewal fee to conduct their business. For a hypothetical pub to sell liquor in Local Government X, for example, an application fee would cost approximately \$A480, registration to serve food (class 2) would cost approximately \$A1059 and a gaming licence application to operate poker machines on the premises would cost approximately \$A2289. However, this pub would not be required to apply for a licence to sell tobacco either at the PoS or through a vending machine, or necessarily be subjected to regular compliance testing with respect to the relevant legislation.

This study is not without limitations. The absence of a significant association between a retailer being included in the existing database and SES and smoking may be because there was insufficient variation in these variables in Local Government X. As there are few restrictions on the types of retailers that can sell tobacco products in Victoria, a large number of potential retailers had to be physically visited or contacted via telephone to determine whether or not they sold tobacco.²³ Due to time and logistical constraints, it is possible that not all existing retailers were identified by this approach; several potential retailers were closed during repeat visits (eg, venues that only host a limited number of events per year) and some retailers may only operate seasonally. It is also possible that the existing database from Local Government X was updated between its provision and the site visits. A further limitation is the possibility that businesses with signage and/or a cigarette gantry to indicate

the sale of tobacco were misclassified during the site visit as a tobacco retailer when they did not actually sell tobacco anymore (a false-positive error), or retailers that did not have any signage or infrastructure to indicate the sale of tobacco were misclassified as not a tobacco retailer when they actually did sell tobacco (a false-negative error).

It is also important to note that multiple PoS for individual retailers were not recorded in the original database. For example, a takeaway liquor retailer may have a 'drive-through' where customers can purchase tobacco while being served in their vehicle (conciierge PoS), or they can walk into the premises to purchase tobacco (secondary PoS). Treating individual points-of-sale as the unit of analysis in this way would have provided a more accurate picture of tobacco availability in the municipality. Telephone or internet-based businesses, home-delivery services and wholesalers were also excluded, thus the number of retailers identified in this study does not represent the true availability of tobacco in the community of interest.

Explicitly not collected in this study based on advice from the Ethics committee was information on retailer compliance with tobacco-related legislation, such as adherence to health warning signage and display regulations. Collection of this information would have greatly enhanced the scope of the study to include whether certain business types were more likely to break retailing laws. It is strongly hoped that future research in Victoria is able to address ethical considerations in ways that allow this issue to be examined.

Finally, the results from this study cannot necessarily be generalised to other municipalities as there are large variations in populations and geographical sizes across the state. Each LGA receives different levels of funding to undertake tobacco control activities, and some may have alternative approaches towards identifying and recording tobacco retailers.

CONCLUSIONS

The results of this study show that a large proportion of tobacco retailers are not being accurately identified and recorded in the regional Victorian Local Government Area assessed in the study. As the existing funding model in this state only allows for a limited number of visits to listed tobacco retailers each year, it is vital to improve the accuracy of tobacco retailer databases. The introduction of a comprehensive, positive tobacco retailer licensing system would help to properly monitor and regulate the sale of tobacco products in this state, as already occurs in the gaming, food preparation and liquor retailing industries.

What this paper adds

- ⇒ This study demonstrates that without the support of any form of tobacco retailer licensing system, it is difficult for local government authorities to keep accurate records on how many tobacco retailers are currently operating.
- ⇒ In the absence of such records, a large number of tobacco retailers may be operating without any apparent local government oversight of how they sell this product.
- ⇒ Together, these findings demonstrate the challenges of ensuring compliance with existing tobacco sales legislation in an unlicensed environment.

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Competing interests JB is the Assistant News Editor for BMJ Tobacco Control.

Patient consent for publication Not required.

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Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available. These data are not publicly available as the Local Government involved in the study requested to remain anonymous.

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ORCID iD

John Baker <http://orcid.org/0000-0001-8726-1964>

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