

Assessing youth exposure to tobacco retailing near schools in Kunming, China using geographic information systems and social observation



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Introduction

Globally, 88% of smokers begin smoking before age eighteen.[1] Tobacco retailing near schools constitutes an important environmental determinant of youth smoking initiation.[2] The Chinese tobacco industry has increased its investments in retail outlets following stricter advertising prohibitions. Yet few studies in China have investigated tobacco retailing near schools to systematically assess youth exposure to school proximate tobacco retailing. In an earlier 2009 survey of more than 3,000 16–18 year olds in 13 Kunming high schools, we found that 52.5% of male students and 9.2% of female students had smoked in the last month.[3] There remains an urgent need to connect estimates of youth smoking to contextual and environmental factors that may underlie these behaviors.

We investigate youth exposure to tobacco retailing by mapping tobacco retailer density and proximity to middle- and high-schools in Kunming, the heart of China's tobacco industry.[4] Through the integration of geographic information systems (GIS) technology, on-site observation of retail outlets and school-based focus groups with youth, we to begin to bridge environmental exposure to tobacco retailing with youth knowledge, attitudes and behaviors toward tobacco.

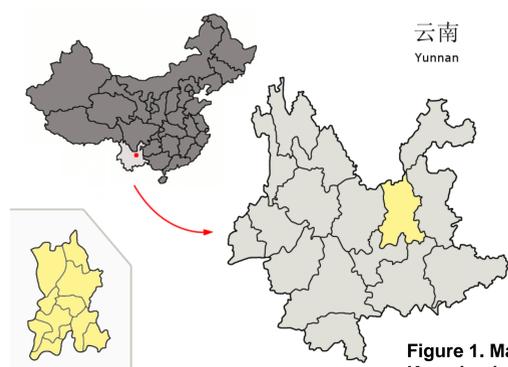


Figure 1. Map showing location of Kunming in Yunnan Province, China

Methods

We conducted our study between April–May 2012. The study area encompassed 5 city districts in Kunming's urban core. Together, these five districts span 16.6 square kilometers and contain 230 kilometers of street length. The study area includes 48 middle-, high- and technical high-schools. We selected these areas as they represent major residential areas within inner city Kunming, and the principals of schools in these districts supported our project. The Chinese tobacco industry has sponsored rural schools and has conducted marketing on school campuses;[5] consequently, not all schools will support work they perceive as against the interests of the tobacco industry.

- **First**, trained observers mapped tobacco retailer density and proximity to 48 schools in five districts in Kunming's urban core. Using a street map obtained from Baidu Maps, investigators conducted on-site surveying. They took notes on each tobacco retailer using a structured observation sheet, recording building number (i.e. address), surrounding geographic information (e.g. cross streets, major landmarks) and information about tobacco marketing in each store. After reviewing the observation sheets, we excluded 10% of recorded retailers.
- **Second**, focus groups with 88 students probed youth perceptions of school-proximate tobacco retailing. We held focus groups in one elementary and one middle school in each of the five city districts included in the study.
- **Third**, structured, on-site observation after the school day documented youth interactions with retailers and catalogued retailers by type.

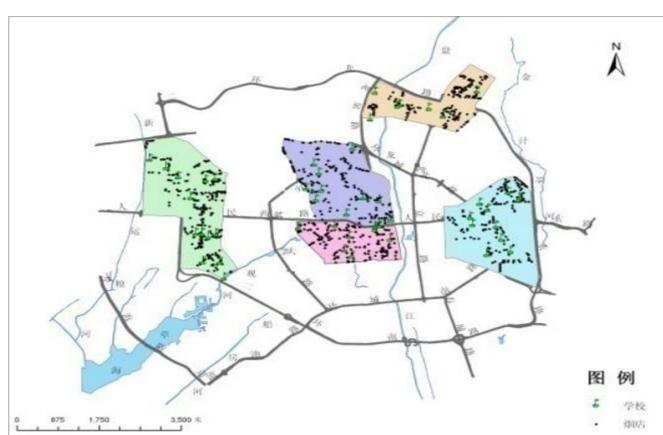


Figure 2. Distribution of tobacco retailers and schools in Kunming's urban core.

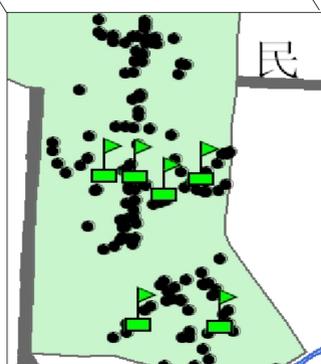
Results

Density

- 60 = average number of tobacco retailers within a 1 kilometer radius of schools (range: 40 – 90)
- 1 = average number of tobacco retailers for every 230 meters of street length

Proximity

- 86% of schools had at least 1 tobacco retailer within 50 meters of campus (average of 1.7 retailers; maximum of 4 retailers)
- 88% of schools had at least 1 tobacco retailer within 100 meters of campus (average of 3 retailers; maximum of 8 retailers)



Types of tobacco retailing

The most frequent types of tobacco retailers within 50 and 100 meters of schools were convenience stores (311, 31%) followed by grocery stores (291, 29%), tobacco stores (179, 18%), newspaper stands (144, 15%), food/snack stalls (59, 6%) and other store types (11, 1%). We found tobacco sold in a variety of unexpected venues including small hotels, print shops, retail agencies, dry cleaners, shoe repair shops, photo print shops and high end gift stores.

Table 1: Different kinds of advertising on display by tobacco retailer types, n (%)

	No. stores	Posters	Door signs	Lighted displays	Banners	Leaflets	No ads
Convenience stores	311	224 (72.02)	43 (13.82)	30 (9.65)	3 (0.96)	3 (0.96)	69 (22.19)
Grocery stores	291	195 (67.01)	67 (23.02)	42 (14.43)	7 (2.41)	1 (0.34)	65 (22.34)
Tobacco stores	179	139 (77.65)	111 (62.01)	54 (30.17)	10 (5.59)	7 (3.91)	14 (7.82)
Newstands	144	76 (52.78)	2 (1.39)	7 (4.86)	2 (1.39)	2 (1.39)	65 (45.14)
Snack stalls	59	43 (72.88)	5 (8.47)	2 (3.39)	5 (8.47)	1 (1.69)	13 (22.03)
Other store types	11	6 (55.54)	0 (0.00)	1 (9.09)	1 (9.09)	0 (0.00)	3 (27.27)
Total	995	683 (68.64)	228 (22.91)	136 (13.67)	28 (2.81)	14 (1.41)	229 (23.02)

Qualitative focus groups

We conducted focus groups with 88 students from 12 schools in the study area. Youth described school-proximate retailing as “normal” and purchasing tobacco as “easy.” Students reported watching their peers purchase tobacco at retailers near schools or bring tobacco to school from home. There was some indication from the focus group discussions that students at technical high schools may face greater exposure to tobacco retailing – or be more impacted by similar levels of exposure – than students at regular high schools, as technical high school students offered more information on tobacco retailers in their school neighborhoods.

“Buying tobacco is really easy. If you want some, I can go get you some within just five minutes!” (买烟很容易, 你如果要, 我5分钟就可以帮你买回来!)

“Places selling tobacco are basically right at the school gate. Just about every day people go to these shops. Buying tobacco, selling tobacco – these are things that classmates feel are very normal.” (卖一烟的地方基本都在学校门口, 几乎每天都有人去他们店一购一买一烟, 卖一烟的事情同学们都感到很正常)

“Personally I think it's very normal. That isn't to say that students who don't buy tobacco near school won't buy tobacco. If a student really wants to buy tobacco, they can do so away from school. All they have to do is walk a few streets away.” (我个人认为很正常, 不是说不在学校周边买烟学生就不会去买烟草, 如果学生从心里想要购买烟草的话, 不在学校周边购买也可以阿, 只是多走几步路而已)

Conclusions

The finding that students in Kunming experience high exposure to tobacco retailing measured by density and proximity to schools demonstrates the importance of regulating retail environments under broader tobacco control initiatives. Limiting youth exposure to tobacco retailing near schools in China does not require the creation of new legislation. Stronger implementation of existing laws and policies would allow city, state and national officials to protect youth from tobacco retailing around school campuses. We offer the following recommendations:

1. Implement and enforce existing national laws that protect youth against tobacco, including the Protection of Minors Law (未成年人保护法) and the Prevention of Juvenile Crimes Law (预防未成年人犯罪法).
2. Create new laws restricting tobacco retailer density and proximity to high schools and middle schools.
3. While waiting for the creation of national law, officials in Kunming should, in accordance with current municipal regulations, set a deadline for the removal of stores selling tobacco – both licensed and unlicensed – within 100 meters of schools.

Our study also demonstrates that civil society organizations and tobacco-affected communities can use GIS technologies in combination with other field-based methods to characterize tobacco retail environments and use these findings to support evidence-based policy advocacy. This work can be done even in places which, like Kunming, are major financial centers of the tobacco industry. We encourage other organizations fighting tobacco to begin documenting the penetration of tobacco retailers around child-centered spaces in their communities.

Literature cited

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Acknowledgments

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