The association between local tobacco retail licensing and adult cigarette smoking by race/ethnicity, income, and education in California (2012–2019)

Bukola Usidame a,*, Yanmei Xie a, David Colston b, Andrea R. Titus c, Lisa Henriksen d, Brian C. Kelly e, Nancy L. Fleischer a

a University of Michigan, Ann Arbor, MI, United States
b University of North Carolina Chapel Hill, United States
c NYU Grossman School of Medicine, United States
d Stanford University School of Medicine, United States
e Purdue University, United States

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ABSTRACT

This study investigates the association between the strength of TRL ordinances and adult cigarette use, and differences in the relationship by sociodemographic characteristics, using California as a case study. We merged geocoded data from the California Health Interview Survey with the State of Tobacco Control Reports from the American Lung Association from 2012 to 2019. Each jurisdiction was graded (A-strongest to F-weakest) based on the strength of their TRL ordinance while current cigarette use was defined as respondents who had smoked 100 or more cigarettes in their lifetime and currently smoke cigarettes every day or some days. We estimated multilevel logistic regression models to test the relationship between the strength of the TRL ordinance and current cigarette use and tested for effect modification by including interaction terms for race/ethnicity, income, and education in separate models. 11.6 % of sample participants from all years (n = 132,209) were current cigarette smokers. Adults in jurisdictions with stronger grades (A-D) had lower odds of current cigarette use (OR = 0.89, 95 % CI: 0.79–1.01) compared to adults in jurisdictions with the weakest grade (F), but the association was not statistically significant (p < 0.07). We found no evidence of effect modification by race/ethnicity, income, or education. We found limited evidence that stronger TRL ordinances were associated with lower adult cigarette smoking in California. However, future studies testing the relationship between TRL ordinances and adult smoking outcomes should examine the role of TRL fees across jurisdictions and adult cigarette use.

1. Introduction

Tobacco retail licensing (TRL) laws require businesses to obtain government-issued licenses to sell tobacco products. (Centers for Disease Control and Prevention CDC, 2021) These policies have been enacted to regulate the availability of tobacco products and tobacco marketing, (Kong and King, 2020; Ackerman et al., 2017) lessen socioeconomic disparities in retailer density, (Kong and King, 2020; Lawman, 2019) and decrease the number of tobacco outlets near schools. (Ackerman et al., 2017) TRL laws also improve compliance with other tobacco control laws, including minimum age sales laws, flavored tobacco restrictions, or sales restrictions through the use of vending machines or self-service displays. (Dobbs et al., 2021) Ideally, tobacco retail licensing laws provide funding for enforcement. (Lee et al., 2016; Robertson et al., 2016).

As of December 2021, 41 states and Washington DC required tobacco retailers to purchase licenses to sell tobacco products (including e-cigarettes). (CDC, 2021) There is considerable variation in TRL laws at the state and local levels. (CDC, 2021) In many states, some localities enact provisions that are stronger than state TRL laws. For example, while California TRL law requires retailers to acquire an annual $265 state license, the fourth-highest fee in the nation, (American Lung Association ALA, 2020) almost one-third of California localities have separate TRL requirements. (Policy Evaluation Tracking System PETS, 2021) In

* Corresponding author.
E-mail address: oussidame@purdue.edu (B. Usidame).
California, over 200 localities passed separate provisions requiring retailers to obtain a local license to sell tobacco products, (Policy Evaluation Tracking System, xxxx) and these additional requirements from over 150 of those localities are stronger than the state licensing law, e.g., annual TRL fees (higher than state fees) and revoking retailer licenses following violations of TRL provisions. (ALA, 2020).

Living in a community with a TRL law is associated with lower tobacco use among youth. (Astor et al., 2019; Siegel et al., 1999; DiFranza, 2012) Yet, while research demonstrates associations between TRL laws and youth cigarette and e-cigarette use, (Astor et al., 2019; Siegel et al., 1999; DiFranza, 2012) the relationship between TRL laws and adult smoking has not been examined. Furthermore, prior research has rarely considered TRL policy heterogeneity or strength in examining these associations. The only study to consider policy strength observed that living in communities with strong local TRL laws was associated with a lower prevalence of youth tobacco use compared to living in communities with weak local TRL laws. (Astor et al., 2019).

While little information on the relationship between TRL laws and adult tobacco use exists, we hypothesize that stronger local TRL laws will be associated with lower adult cigarette use. Our hypothesis is based on research among youth as well as on retail density and tobacco use. TRL laws have been associated with lower retail density, (Astor et al., 2019; Valiente et al., 2021) and several studies show reductions in tobacco retail store density following local TRL implementation. (Lawman, 2019; Lawman et al., 2020; Jin et al., 2016; Coxe et al., 2014) Further, studies have shown that lower tobacco retail density is associated with lower adult tobacco use. (Kong and King, 2020; Valiente et al., 2021) Thus, an indirect association between TRL laws and adult tobacco use may exist via reductions in retail density. Considering this indirect association, and the relationship between stronger TRL laws and lower youth tobacco use, we hypothesize that living in communities with stronger local TRL laws will be associated with a lower adult smoking prevalence compared to communities with weaker local TRL laws.

Research has identified the impact of tobacco control policies on disparities in tobacco use, (Garrett et al., 2015) but limited empirical work examines the relationship between the heterogeneity of local TRL laws and tobacco use disparities. Descriptive and simulation studies suggest that lower retail density would be associated with more pronounced reductions in smoking for individuals from lower socioeconomic status (SES) or racial/ethnic minority groups. (Kong and King, 2020; Craigmille et al., 2020) Low-income and racial/ethnic minority neighborhoods often have higher tobacco retailer densities. (Kong et al., 2021) Hence, we also hypothesize that stronger local TRL laws will be more strongly associated with lower smoking prevalence among adults from lower SES or racial/ethnic minority populations. Our study fills such research gaps on the association between TRL laws and adult cigarette use and to identify possible differences in the association across sociodemographic groups. Integrating local-level policy data with individual-level smoking data from California, we assessed associations between strength of local TRL laws (henceforth, ordinances) and adult smoking prevalence from 2012 to 2019, including differences by race/ethnicity, income, and education.

2. Methods

2.1. Data sources

We used two main data sources for this study. Individual-level variables were obtained from the California Health Interview Survey (CHIS) 2012–2019 surveys. CHIS is the largest ongoing health survey in California and is representative at the state and county levels. It is a mixed-mode (web and telephone) repeated cross-sectional, annual survey of approximately 50,000 California children, adolescents, and adults beginning biennially in 2001 but annually since 2011. While state and county-level identifiers are publicly available, city-level identifiers, which we used for this study, are only available via restricted data. More details on the CHIS sampling design are available elsewhere. (Ponce et al., 2004; California Health Interview Survey CHIS, 2021).

We obtained data on TRL ordinances from the State of Tobacco Control Report (SOTC) for 2012–2019. SOTC data is coded and summarized by the American Lung Association (ALA). (ALA, 2020) The report contains grades scoring the strength of retailer licensing ordinances for all California jurisdictions, including the 482 incorporated cities and towns and the unincorporated areas from each of the 58 counties. Our study focused on ordinances for incorporated cities and towns and included CHIS study participants from 482 California jurisdictions.

Data for county-level covariates, state cigarette tax, and smoke-free laws (described below) were obtained from the American Community Survey 5-year estimates (ACS 2012–2019), the Tax Burden on Tobacco from the Center for Disease and Control (CDC), and the SOTC report respectively. (American Community Survey ACS, 2020; CDC, 2021) The study received an IRB exemption as a secondary analysis of de-identified data.

3. Measures

3.1. Outcome variable

Cigarette use. CHIS assessed current cigarette use as respondents who smoked 100 or more cigarettes in their lifetime and currently smoke cigarettes every day or some days.

3.2. Exposure variable

TRL ordinances. In the ALA report, (ALA, 2020) TRL ordinances are graded according to four provisions (Table 1): (1) all tobacco retailers are required to pay an annual fee that sufficiently covers administration and enforcement efforts, including compliance checks; (2) all retailers are required to obtain a license to sell tobacco and renew it annually; (3) any violation of a local, state or federal tobacco law is considered a violation of the license; and (4) the inclusion of a financial deterrent through fines and penalties such as the suspension and revocation of the license. Of the four provisions, the most essential is requiring retailers to pay an annual fee that “sufficiently” covers administration and enforcement efforts (the definition of “sufficient” varies across jurisdictions, as it is dependent on each jurisdiction’s unique cost of administration and enforcement efforts). (ALA, 2020).

Our initial analysis of the ordinance variable showed a bimodal distribution of the population within the jurisdictions by grade, with over half (53 %) of the population residing in jurisdictions with the strongest grade (A) and over one-third (37.1 %) in jurisdictions with the weakest grade (F). The remaining 10 % of the population was split within the jurisdictions graded B, C, and D. Therefore, we redefined the ordinance variable into two functional forms: a) a binary variable where jurisdictions with the weakest grade (F) were coded as 0 and jurisdictions with higher grades (A-D) were coded as 1 (used in the main model);

| Grade | Provision |
|-------|-----------|
| A     | Licensing ordinance with sufficient annual fee and the other 3 provisions outlined above |
| B     | Licensing ordinance with sufficient annual fee and 2 of the other 3 provisions outlined above |
| C     | Licensing ordinance with sufficient annual fee and 1 of the other 3 provisions outlined above |
| D     | Licensing ordinance with sufficient annual fee and 0 of the other 3 provisions outlined above OR licensing ordinance with an insufficient annual fee and any of the other 3 provisions outlined above |
| F     | No licensing ordinance or a licensing ordinance with none of the provisions outlined above |
and (b) a binary variable where jurisdictions with the strongest grade, A, were coded as 1 and those with any lesser grade (B–F) were coded as 0 (sensitivity analysis).

3.3. Covariates:

Sociodemographic measures (individual-level). We controlled for age, sex, race/ethnicity, annual total household income, and education. Age is measured as a categorical variable (25–34, 35–54, and 55+ years). Sex is defined as female or male. Race/ethnicity is a categorical variable with 4 categories: Hispanic, non-Hispanic White (NHW), non-Hispanic Black (NHB), and another race/ethnicity including multiracial respondents (AR/E). Total household income in the past 12 months was categorized as low income (less than $50,000), medium income ($50,000–$100,000), and high income (more than $100,000). Education was redefined into four categories: (less than high school, GED/high school graduate, some college (no degree) or associate degree, and 4-year college degree or more). All analyses were restricted to adults aged 25 and older to ensure all respondents had an opportunity to complete their educational attainment.

Sociodemographic measures (county-level). We controlled for area-level sociodemographic measures, including poverty level (percentage of residents below poverty level), education (percentage of residents with a college degree or more), and race/ethnicity (percentage of the population that identified as Hispanic and Black population, separately).

Policy variables. We controlled for additional ordinances that are potential confounders of smoking, including smoke-free ordinances and state cigarette taxes (California has no local excise taxes). (Chaloupka et al., 2011; National Center for Chronic Disease, 2014) Smoke-free laws, which are updated annually, for each jurisdiction were taken from annual ALA reports, (ALA, 2020) and coded as an ordinal variable, 1–4, denoting ordinance strength, with 1 the weakest and 4 the strongest. State excise taxes on tobacco were inflation-adjusted for all years included. We included year in the model to account for temporal trends during the study period.

3.4. Geographic data linkage

Policy data included the names of jurisdictions while the restricted CHIS survey data included zip codes for study participants. To match the TRL ordinance grade with the CHIS data, we used the 2010 version of the MABLE geographic platform, (the latest version). The MABLE geographic platform is housed at the Missouri Census Data Center and provides geographic correspondence files for dozens of geographic layers for the United States (50 states and DC), (Missouri Census Data Center MCDC, 2021, xxxx) and assigns each zip code to its corresponding jurisdiction name. After matching jurisdiction names with zip codes, we had less than five duplicate zip codes where a zip code crossed two jurisdiction boundaries and was assigned different jurisdiction names with different grades. In such instances, we assigned the grade for the jurisdiction with the greater population to the zip code. Once all unique zip codes were assigned to jurisdictions, we merged the policy and CHIS data.

3.5. Analysis

All analyses were conducted using pooled data for 2012 to 2019 and accounted for the CHIS survey design using replicate weights. We calculated weighted descriptive statistics for population characteristics, including age group, sex, race/ethnicity, education, income, and current cigarette use status. Next, we calculated the ordinances grade distribution by sample characteristics, specifically race/ethnicity, education, income, and current cigarette use status. We conducted unadjusted and adjusted multilevel logistic regression models to examine the association between the strength of the TRL ordinance and current cigarette use, accounting for participants clustered within jurisdictions.

We tested multiplicative interactions between the strength of the TRL ordinance and race/ethnicity, income, and education variables, in separate models, on current cigarette use by the inclusion of interaction terms in three separate models.

In a sensitivity analysis, we used the second functional form of the ordinance variable by testing the association between TRL ordinances and current cigarette use for participants in areas with the strongest grade (A) vs those in areas with weaker grades (B–F).

4. Results

As shown in Table 2, 51.7 % of the sample identified as female. There were 42.5 % NHW participants, 33.9 % Hispanic participants, and 6.1 % NHB participants. Approximately 40 % of the population was classified into two age categories: 35–54 years and 55 and over, while 21.6 % were aged 25–34 years. More than 40 % of the population had a bachelor’s degree or more, while 16.3 % had less than a high school degree. Over 40 % of the population had a household income of <$50 K/year, and 11.6 % of the sample population reported current cigarette use.

The weighted ordinance grade distribution by sample characteristics is included in Fig. 1. There were more NHW and AR/E participants in communities with stronger grades (67.2 % and 52.3 %, respectively) than in communities with the weakest grade (32.8 % and 47.7 %, respectively). Conversely, all other racial/ethnic groups had more

| Variable | n (unweighted) | % |
|----------|---------------|---|
| Total    | 132,309       | 100 |
| Sex      |               |    |
| Male     | 63,958        | 48.3 % |
| Female   | 68,351        | 51.7 % |
| Race/ethnicity |        |    |
| Hispanic | 44,800        | 33.9 % |
| Non-Hispanic White | 56,258 | 42.5 % |
| Non-Hispanic Black | 8031 | 6.1 % |
| Another race/ethnicity | 20,746 | 15.7 % |
| Unstated | 2461          | 1.9 % |
| Age      |               |    |
| 25 to 34 | 28,513        | 21.6 % |
| 35 to 54 | 53,056        | 40.1 % |
| 55 and over | 50,754 | 38.4 % |
| Education |             |    |
| <High school | 21,553 | 16.3 % |
| High school  | 26,277  | 19.9 % |
| Some college | 29,386 | 22.2 % |
| 4-year college + | 53,426 | 40.4 % |
| Unstated  | 1667          | 1.3 % |
| Income   |               |    |
| <$50 K  | 57,078        | 43.1 % |
| $50 K–$100 | 39,825 | 30.1 % |
| >$100 K | 35,406        | 26.8 % |
| Tobacco use |           |    |
| Current cigarette use | 15,388 | 11.6 % |
| Cities by policy grade (unweighted) | |    |
| A        | 177           | 36.7 % |
| B        | 142           | 29.5 % |
| C        | 40            | 8.3 % |
| D        | 32            | 6.6 % |
| F        | 90            | 18.7 % |
participants living in jurisdictions with the weakest grade than jurisdictions with stronger grades. However, the proportion of participants living in jurisdictions with stronger grades vs the weakest grade varied with no consistent pattern by education and income (Fig. 1). Over half of participants (53.0 %) who reported current cigarette use lived in jurisdictions with the weakest grade (Fig. 1).

Results from the main regression models are reported in Table 3. In the unadjusted models, participants living in jurisdictions with stronger grades reported lower odds of current cigarette use (OR = 0.77, 95 % CI: 0.66–0.88) compared to participants living in jurisdictions with the weakest grade. In the adjusted model, the estimates were slightly attenuated (AOR = 0.89, 95 % CI: 0.79–1.01) and the association was no longer statistically significant (p < 0.07). We found no statistically significant interactions between strength of the TRL grade and race/ethnicity, income, or education for current cigarette use (Table 3).

Sensitivity analysis. We examined the relationship between TRL grade and current cigarette use by specifying the exposure variable dichotomized as the strongest TRL grade (A) vs weaker grades (B-F). The weighted TRL grade distribution by sample characteristics using this functional form is included in Appendix Fig. 1. The results from the regression models were similar to the main models. In the unadjusted model, the strongest TRL grade was associated with lower odds of current cigarette use (OR = 0.83, 95 % CI: 0.71–0.97) compared to the lower TRL grades; however, the association was attenuated and no longer statistically significant in the adjusted model. (AOR = 0.94, 95 % CI: 0.83–1.06). There were also no statistically significant interactions between strength of the TRL grade and race/ethnicity, income, or education for current cigarette use. Detailed results including the interactions are included in Appendix Table 1.

5. Discussion

We investigated the relationship between strength of TRL ordinances on adult cigarette use and assessed differences in this relationship by race/ethnicity, income, or education.

Our finding that there was no statistically significant association between the strength of TRL ordinances and adult cigarette use differs from similar research among youth. (Astor et al., 2019) Specifically, past research showed an association between strong TRL ordinances and reduced youth cigarette and e-cigarette use. (Astor et al., 2019) However, our study methodology differed from this study in three ways. First, the prior study assessed the relationship between the strongest TRL grade (A) vs the two weakest grades (D and F) leaving out jurisdictions with moderate grades (B or C), while we included communities across all grades. Second, their models did not control for smoke-free laws; we included smoke-free laws in our models to better control for the local tobacco regulatory environment. Lastly, and most importantly, we examined adults from a statewide sample as opposed to only Southern California. (Astor et al., 2019) It is important to note that TRL ordinances are generally promoted as measures to restrict youth access to tobacco products as they may derail tobacco initiation and provide funding for enforcement of tobacco laws prohibiting illegal sales to minors. (Dobbs et al., 2021) Our study aimed to examine if these benefits extended to the adult population. However, we examined current cigarette use only and did not examine smoking cessation or frequency of cigarette use. TRL ordinances may be associated with patterns of adult smoking cessation and not simply whether they smoke. Future studies should assess the relationship between TRL ordinances and adult smoking cessation outcomes, or frequency of cigarette use to provide further insight into the potential impact of TRL ordinances on adult tobacco use.

There are several potential reasons why we did not see stronger associations between TRL ordinances and adult cigarette use. First, California has one of the strongest tobacco control environments in the country, as well as the fourth-highest state licensing fee, (Centers for Disease Control and Prevention, 2021) such policies may have created marginal returns for additional local policies. Studies have shown that a TRL fee increase from an initial low TRL fee is a potentially effective method to reduce tobacco sales, especially when consumer demand is low. (Burton et al., 2020; Bowden et al., 2014) Second, California’s TRL law has a mandatory annual fee of $265, an increase from $100 in 2017 (the second-highest state licensing fee in the country at that time), (Centers for Disease Control and Prevention, 2021) and for an ordinance to be considered stronger than the state law, its additional fee requirement must at least be sufficient to cover the cost of enforcement visits.

Fig. 1. Distribution of policy by selected characteristics, California Health Interview Survey, 2012–2019.
We found that the TRL ordinances were not associated with socio-demographic differences in adult cigarette use – race/ethnicity or SES.
status. Per race/ethnicity, we observed a higher proportion of NHB participants living in jurisdictions with stronger grades vs the weakest grade. Simulation work has shown that licensing laws may have more beneficial impacts on individuals from racial/ethnic minority groups, via a reduction in retail density.  

Future studies should consider examining the association between strength of TRL grades and adult cigarette use limited to communities with majority NHB population groups. Concerning SES groups, research has shown that TRL laws benefit individuals from lower SES groups more than individuals from higher SES groups. An empirical study observed greater reductions in tobacco retail density in districts with more low SES residents following several TRL ordinances, including a density cap of one tobacco retailer per 1000 residents, no new retailers allowed within 500 feet of schools, and a 50% increase in the TRL fees (from $50 to $250). (Coxe et al., 2014) However, retailers in low SES neighborhoods are less likely to comply with tobacco control laws than those in high SES neighborhoods, which may counteract the potential for differential impact among licensed retailers. (Fry et al., 2017; Frick et al., 2012; Baker et al., 2020) Policy education prompts voluntary decisions by retailers to stop selling tobacco products, which further denormalizes tobacco and lays the foundation for mandatory policies such as TRL ordinances. (McDaniel and Malone, 2014) Additional policies such as restricting flavored tobacco sales and prohibiting discounts and coupon distribution/redemption retailer educational initiatives are also encouraged to address the persistent use of cigarettes within low SES neighborhoods, as they remain targets of tobacco marketing. (Lee et al., 2015) Future studies should examine the association between TRLs in combination with additional laws and adult cigarette use by socio-demographic factors.

Our study has several limitations. First, our analyses excluded young adults, 18–24 years old, to reflect a more accurate sample with respect to SES, as respondents are more likely to reach full employment beyond school by the age of 25. Although this is a strength, we are unable to assess the unique relationship between TRL ordinances and smoking among young adults, who constitute a large proportion of adult smokers and are more likely to be impacted by any tobacco ordinance. (Hammond; Reid et al., 2017; Astor et al., 2019) Second, parallel to introducing the TRL ordinance, several jurisdictions adopted other laws such as density caps or flavor bans, which we did not control for as these were not included in the ALA reports for all study years. However, cigarette taxes and smoke-free laws have been shown to have a significant impact on cigarette use, and we controlled for both laws. (Chaloupka et al., 2011; Titus et al., 2022) Third, the definition of “sufficient fees” differed across jurisdictions as it was dependent on the number of retailers, and unique costs for administration and enforcement incurred by each jurisdiction. Given the ALA grade-based scoring system, we were unable to tease out the impact of the local TRL price differences, which would provide more insight into the role of TRL costs. Lastly, with the use of repeated cross-sectional data, we focused on the association between the study outcomes and not causation. With this study design, we cannot confirm causal impact of TRL ordinances on adult smoking. Future studies should consider using causal inference study designs to determine the impact of TRL ordinances on smoking outcomes.

6. Conclusion

We found weak evidence that stronger TRL ordinances are associated with lower adult cigarette use, although the association was not statistically significant after adjustment. However, we did not observe any differences by race/ethnicity, income, or education. Despite the lack of a statistically significant association between stronger TRL ordinances and adult cigarette use, local policymakers are encouraged to adopt TRL ordinances for other benefits, including reducing smoking among youth. (Astor et al., 2019) Future studies testing the relationship between TRL ordinances and adult smoking outcomes, including cessation, should consider other local tobacco control laws, such as pharmacy bans, zoning laws, or retail density caps, and examine the role of variable TRL fees across jurisdictions.

Data availability statement

Researchers can apply for the California Health Interview Survey (CHIS) restricted data through the CHIS Data Access Center while policy data from the American Lung Association is publicly available on their website or through correspondence with the association.

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CRediT authorship contribution statement

Bukola Usidame: Conceptualization, Writing – original draft, Methodology, Visualization, Writing – review & editing. Yanmei Xie: Data curation, Formal analysis, Methodology, Software, Writing – review & editing. David Colston: Writing – review & editing. Andrea R. Titus: Writing – review & editing. Lisa Henriksen: Writing – review & editing. Brian C. Kelly: Writing – review & editing. Nancy L. Fleischer: Conceptualization, Funding acquisition, Supervision, Writing – review & editing.

Data availability

The authors do not have permission to share data.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpmedr.2022.102064.

References

Ackerman, A., Etow, A., Bartel, S., Risbey, K.M., Feb 2017. Reducing the Density and Number of Tobacco Retailers: Policy Solutions and Legal Issues. Nicotine Tob. Res. 19 (2), 133–140. https://doi.org/10.1093/ntr/ntw124.
American Community Survey (ACS), 2020. American Community Survey 1-year Public Use Microdata Samples for 2012-2019 [SAS Data file]. Publisher: United States Census Bureau 2021.
Astor RL, Urmann R, Barrington-Trinis JI, et al Tobacco Retail Licensing and Youth Product Use. Pediatrics. Feb 2019;143(2):1.1542/peds.2017-3536.
American Lung Association (ALA), 2020. Proven Policies to Prevent and Reduce Tobacco Use. State of Tobacco Control. American Lung Association, California.
Baker, J., Masoud, M., Rahman, M.A., Begg, S., 2020. Levels of support for the licensing of tobacco retailers in Australia: findings from the National Drug Strategy Household Survey 2004–2016. BMC Public Health. 20 (1), 773. https://doi.org/10.1186/s12889-020-08920-1.
Bowden, J.A., Dono, J., John, D.L., Miller, C.L., Mar 2014. What happens when the price of a tobacco retailer licence increases? Tob. Control 23 (2), 178–180. https://doi.org/10.1136/tobaccocontrol-2012-050615.
Burton S, Phillips F, Watts C, et al. Who sells tobacco, who stops? A comparison across different tobacco retailing schemes. Tob. Control. Jul 2 2020;10.1136/tobaccocontrol-2019-055561.
California Health Interview Survey (CHIS), 2021. CHIS 2019-2020 Methodology Series: Report I - Sample Design. 2021.
