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Assessing the Effectiveness of Tobacco 21 Laws to Reduce Underage Access to Tobacco: Protocol for a Repeated Multi-Site Study

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ABSTRACT

Background: Prior to the federal law passed in late 2019, many states passed an increased age of sale law prohibiting youth under age 21 (or Tobacco 21) from purchasing tobacco products and e-cigarettes. Although previous research has documented tobacco retail sales violations, fewer studies have examined age verification and illegal tobacco sales in the context of Tobacco 21 or in repeated purchase attempts in various settings.

Methods: In this study conducted between 2019 and 2022, buyers aged 18 to 20 years made repeated unsupervised purchase attempts of cigarettes, cigars, e-cigarettes, tobacco-free nicotine pouches and/or smokeless tobacco in store visits to over 180 tobacco or vape retailers in New Jersey, New York City, and Pitt County, North Carolina. Buyers documented whether they were asked for identification and whether they were able to successfully purchase a tobacco or nicotine product at each visit.

Results: The primary outcome will be the percent of retailers that checked buyers' identification at store visits and the percent of visits that resulted in a successful underage tobacco product purchase. We will aim to compare the results across time periods and study sites while controlling for other factors (including repeated visits).

Conclusion: These results will be beneficial to designing compliance check inspections and/or interventions that reduce youth access to tobacco.

Keywords: tobacco age of sale; tobacco policy; youth; young adults

1. INTRODUCTION

Despite notable reductions in cigarette smoking in the United States (U.S.), concerns about tobacco use among youth and young adults remain.¹ Experimentation and initiation before the age of 18 has been a strong predictor of adult daily tobacco use; 87% of adults who had ever smoked cigarettes daily tried their first cigarette by the age of 18.² As such, efforts to delay tobacco initiation and decrease experimentation are high priorities for tobacco control. In particular, increasing the minimum legal sales age for tobacco products to age 21, or Tobacco 21 (T21), has been adopted as a promising strategy to delay tobacco initiation and reduce tobacco use prevalence among youth.

A 2015 Institute of Medicine (IOM) report concluded that raising the minimum tobacco sales age to 21 nationwide would reduce smoking initiation over time by 25% among 15- to 17-year-olds and by 15% among 18- to 20-year-olds.³ The reduction in tobacco use initiation by 18 to 20 year olds achieved by T21 would be the result of disrupting the acquisition channel for underage users by reducing social access to tobacco via older peers and interrupting the trajectory from experimentation to regular use.³ While about 30 localities (largely in Massachusetts) adopted T21 before 2015, the IOM report accelerated diffusion, to over 500 local and 19 state laws, before culminating in a federal T21 law passed in December 2019.³⁻⁵

The extent to which T21 will reduce youth access depends on consistent implementation. An important question remains as to whether T21 laws improve age of sale compliance among retailers, both by increased requests for proof of age and decreased sales to underage buyers. Recent observational data from early adopters of T21 policies provide evidence that such policies may curb rates of youth and young adult tobacco use including e-cigarettes⁶⁻¹¹, but the limited data available from retail compliance checks are mixed and suggest that policies are not uniformly enforced.¹²⁻¹⁵ Following New York City's T21 law, retailer compliance with identification (ID) checks of legal age buyers actually declined from 71% to 61.4%, with chain store retailers having higher rates of compliance versus independent stores.¹³ After T21 became effective in California, youth (aged 15-16) were successful in 5.7% of buy attempts for traditional tobacco (i.e., cigarettes, little cigars or cigarillos, big cigars or chew tobacco) while 14.2% and 13.2% of young adults (aged 18-19) succeeded in buying traditional tobacco and e-cigarette products, respectively; in this study, tobacco and vape shops were more mostly likely to make an illegal sale.¹⁴ In a study conducted among 91 retailers in Columbus, Ohio in both 2017 and 2018, researchers found that 39% of retailers conducted ID checks before T21 compliance, and this increased to 78% in the year after the citywide implementation of the T21 law.¹⁵

However, previous research suggests that single compliance checks may not provide accurate estimates of retailer compliance.^{16,17} While underage buys have been widely used to measure cigarette sales to minors, there are numerous methodological limitations of current underage buyer protocols that ultimately limits the ecological validity of their findings.¹⁸ A “familiarity protocol” is recommended to reflect real world purchasing behaviors, including the use of buyers with tobacco use experience who look and act like tobacco users, and repeated visits at the same store with the same buyer.¹⁹ Repeated visits are thought to improve reliability as a single buy is subject to variability based on time of day, the clerk on duty, and other contextual factors.

We describe a protocol for a tobacco purchase study conducted across three sites, including New Jersey, New York City, and North Carolina, to assess whether tobacco retailers asked for proof of age from and/or sold tobacco products to underage purchasers.

2. METHODS

2.1 Sample

The sampling frame in New Jersey included all licensed tobacco retailers in municipalities within a 25-mile radius of New Brunswick, New Jersey. In 2019, there were 4011 tobacco retailers within the selected area. We identified and removed 529 liquor stores that from the sampling frame. We then randomly sampled 50 retailers from high population density municipalities (n=1884) and 50 retailers from low population density municipalities (n=1598). Prior to fielding, research staff completed store audits in person to confirm that stores were open and assessed availability of all tobacco products, after which 14 stores were removed from the sample because of permanent closure (4), bar/liquor stores (4), safety concerns (3), or tobacco no longer for sale (3), leaving a final sample of 86 licensed tobacco retailers. In 2021, visits were repeated in 65 licensed tobacco retailers and 10 additional vape shops, following similar parameters (within 25 miles of New Brunswick, New Jersey).

In 2021, we included data collection sites in the Borough of Manhattan in New York City, NY (NYC) and Pitt County, North Carolina (NC), around Greenville. Each site selected 50 tobacco retailers and up to 10 vape shops or as many as available in the jurisdiction. The full sample set was comprised of 56 stores in NC, 56 stores in NYC, and 74 stores in New Jersey, for a total sample of 186 tobacco or vape retailers.

2.2 Covert buyers

We recruited and trained covert buyers between the ages of 18 and 20. Given previous research suggesting that sales to minors varied by gender and race/ethnicity,^{18,25,26} attempts are made to recruit a racially, ethnically, and gender diverse team of buyers. Our intention is for each site to have a minimum of two males (non-Hispanic White and person of color) and two females (non-Hispanic White and person of color) who would visit all the stores, individually, to attempt purchases of each tobacco or nicotine product on separate occasions.

2.3 Data collection

The methods for data collection mirrored those from an earlier pilot study in New Jersey conducted around the time New Jersey's T21 law became effective.²⁷ The Rutgers Health Sciences Institutional Review Board determined this study was non-human subject research. In separate visits, each covert buyer was assigned to attempt purchases for each product (e.g., cigarettes, cigar/cigarillos, e-cigarettes, tobacco-free nicotine pouches, smokeless tobacco [NC only]) in every store where the product was available. Federal law requires carding anyone appearing under age 27 who attempts to purchase tobacco. If a store clerk asked buyers about age or more specifically, if they were 21, the buyers were instructed to say, "Do you want to see my ID?" Our buyers were instructed not to lie about age and to show their legal driver's license if asked for ID. In addition to providing birthdate, a New Jersey driver's license is printed on the vertical axis if the license holder is under 21. Buyers repeated purchase attempts in all stores, regardless of outcome.

2.4 Measures

For each store visit, buyers recorded what tobacco product they attempted to purchase (i.e. cigarettes, cigars, e-cigarettes, tobacco-free nicotine pouches, or smokeless tobacco). Additionally, during our availability audit, each store type was classified (i.e. chain convenience, convenience [non-chain] bodega, drug store, gas kiosk only, other [such as discount dollar stores]). Stores classified as chain convenience were typically a franchise or corporate owned in multiple locations with similar inventory and layout, often licensed under a parent company name like Quick Chek or WaWa while non-chain convenience or bodegas were smaller, independently owned grocery/convenience stores with less diverse product inventory and typically licensed under an individual name. Drug stores included all pharmacies including both chain (e.g., Walgreens, Rite-Aid) and smaller independently owned pharmacies. Gas kiosks were retailers primarily selling fuel but limited in other inventory (e.g. did not also include convenience store). General merchandisers such as grocery and dollar stores were classified as other stores.

After each store visit, buyers users a Qualtrics survey to answer several questions including whether they were able to attempt the purchase, the product they attempted to purchase, whether the store clerk asked for identification when attempting to purchase including electronic verification, and whether they were successfully able to purchase. If they are able to purchase the product, they are also asked to provide the price of the product. In 2021 and 2022, buyers were also asked to indicate if they were wearing a mask when attempting to purchase the product.

2.5 Data analysis plan

Our primary outcome variables are whether the store clerk asked to check a buyer's identification (1=yes, 0=no) when attempting to purchase each tobacco product and whether buyers were successfully able to purchase each of the tobacco products (1=yes, 0=no). In addition, our initial analysis will test whether

each explanatory variable was associated with either 1) an identification check and 2) a successful tobacco product purchase, regardless of whether identification was checked. In addition, we will fit a model to test whether each explanatory variable was associated with a successful purchase for those store visits where identification was checked. Because buyers attempted to purchase a single tobacco product type at each store visit, a single store could have been visited up to 15-20 times. To account for this within tobacco retailer dependence, we will use general estimating equations (GEE) with an exchangeable working correlation matrix for all analyses. Finally, in adjusted models, we will all explanatory variables described above. A buyer-level fixed effect will be included in both unadjusted and adjusted models.

3. RESULTS

The primary study finding will be to estimate the extent to which underage buyers can successfully purchase various tobacco products and assess compliance with increased tobacco age of sale law to 21. Secondary findings will be whether other factors (e.g., store type, tobacco retailer density) were associated with identification checks or successful purchases. We will aim to compare the results across time periods and study sites.

4. DISCUSSION

To date, no studies have used a repeated purchase attempt protocol to objectively measure retailer compliance with Tobacco 21 laws across several sites and time periods. Using data from a diverse group of buyers in several sites in the eastern U.S., this study shows that it is feasible to collected data in repeated store visits across a variety of settings.

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