

Public Health Briefs

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## Laying Down the Law: Reducing Illegal Tobacco Sales to Minors in Central Harlem

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### ABSTRACT

**Objectives.** This study compared the impact of educational and enforcement interventions on retailers' sale of tobacco to minors in Central Harlem, New York.

**Methods.** In a randomized trial with repeated measures, 152 stores were randomly divided into control, education, and enforcement groups.

**Results.** Overall tobacco sales to 12- and 13-year-old minors at baseline (98%) were among the highest in the nation. At 6-month and 1-year follow-ups, decreases in rates of tobacco sales to minors were modest among education stores and substantial among enforcement stores.

**Conclusions.** Effective reduction of tobacco sales to minors may require ongoing enforcement measures, including fines for retailers who violate state and local laws. (*Am J Public Health*. 1998;88:936-939)

### Introduction

Tobacco is the nation's leading cause of preventable death and disability and is responsible for more than 400 000 deaths each year.<sup>1</sup> Tobacco use has been termed a "pediatric disease" by the Food and Drug Administration commissioner,<sup>2</sup> because approximately 90% of all initiation of tobacco use occurs among persons 18 years of age or younger.<sup>3</sup> Initiation of smoking at younger ages is associated with a longer duration of smoking and an increased likelihood of nicotine dependence.<sup>4</sup> A goal of *Healthy People 2000* is to reduce roughly by half the use of tobacco products by children and adolescents by the year 2000.<sup>5</sup> Recent data, however, indicate that tobacco use has been increasing among the young.<sup>6</sup> Reducing tobacco use among youth has become a major national priority.<sup>7</sup>

One approach to prevention and control of tobacco use in youth is to restrict sales of tobacco products to minors. All 50 states have laws prohibiting sale of tobacco products to minors (usually defined as those less than 18 years of age),<sup>6</sup> and the Food and Drug Administration has proposed that 18 years be established as the federal minimum age of purchase of tobacco products.<sup>8</sup>

Numerous studies have indicated that adolescents have little difficulty purchasing tobacco products.<sup>9-28</sup> A 1994 surgeon general's report, *Preventing Tobacco Use among Young People*,<sup>3</sup> cited 13 published studies that examined over-the-counter sale of cigarettes to minors from 1989 to 1993.<sup>16-28</sup> The baseline sales rates ranged from 32%<sup>24</sup> to 87%.<sup>26,27</sup>

Little is known about the relative efficacy of educational vs enforcement interventions to enhance the compliance of merchants with laws prohibiting tobacco sales

to minors. The purpose of this randomized trial was to compare the impact of an educational visit to tobacco retailers with that of an enforcement strategy in which retailers found to have sold tobacco to a minor were fined in accordance with the law.

### Methods

A section of central Harlem (New York City) with boundaries from 110th St to 158th St and Fifth Ave to Morningside Ave was selected as the target for this study. Central Harlem is a predominantly African-American community with relatively high rates of poverty, morbidity, and mortality.<sup>29</sup> Within this region, 181 stores possessed licenses to sell tobacco. These stores were randomly assigned to 1 of 3 intervention categories: control, education, or enforcement. Twenty-nine stores that closed or that discontinued cigarette sales during the study period were excluded from the analysis. The 152 eligible stores were categorized as bodegas (convenience stores) (78%), supermarkets (12%), delicatessens (5%), and smokesops (5%). There were no statistically significant differences between bodega

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and nonbodega store types among the control, education, and enforcement groups (there were too few other types of stores to permit more detailed comparisons).

At the time of the initial intervention (October 1993), regulations in New York City and the state of New York prohibited sale of tobacco to persons under 18 years of age, required that vendors obtain proof of age from all people attempting to purchase tobacco products who appeared to be less than 25 years old, and authorized fining merchants in violation of the law. At the time the study was initiated, the law in New York City (the New York City Tobacco Product Regulation Act) contained 1 provision that the New York State law (the Adolescent Tobacco Use Prevention Act) lacked: the former specifically prohibited sale of out-of-package or individual cigarettes.

Project investigators collaborated with faculty and student volunteers from School District 3 in Manhattan. Student volunteers submitted signed informed consent forms from their parents or legal guardians and participated in a training session conducted by school faculty and project staff. The project was approved by the Harlem Hospital Center Institutional Review Board.

In the baseline survey in October, 1993, 15 students (13 girls and 2 boys) 12 or 13 years of age participated. Each student was accompanied to the stores by either a project staff member or a school faculty member who stayed in proximity to the store but remained apart from the student so as not to be perceived as being with the student by the merchant. Upon entering the store, students asked to purchase a single cigarette ("loosie"); if refused, the student would leave the store and a second student would enter the store shortly afterward and ask to purchase a pack of cigarettes. Immediately after leaving the store, the staff or faculty member recorded the store name, location, and type and the results of the transaction.

Follow-up surveys involving the same methodology were conducted in March and April 1994 (6-month follow-up) and in November 1994 (1-year follow-up). At baseline and during the 6-month follow-up survey, the enforcement group stores that violated the law were served a citation and fine by an inspector from the New York City Department of Consumer Affairs in accordance with the provisions of the New York City Tobacco Product Regulation Act (maximum penalty of \$300 for the first violation and \$500 for the second violation). The inspector briefly explained the law and the reason for the citation to the merchant. The education group stores received a single

educational visit within a 3-month period following the baseline survey; there were no additional educational visits after the 6-month follow-up survey. At the educational visit, project staff explained the law, provided educational literature, and answered questions. Educational visits lasted an average of 10 minutes. The control group stores received no intervention.

The 11 students (10 girls and 1 boy) who participated in the second survey (March and April 1994) were taken from the same pool of students who participated in the baseline survey. The 9 students (6 girls and 3 boys) who participated in the third survey in November 1994, although from the same school district, were taken from a different class, resulting in an entirely new group of student volunteers at time 3. One student from this group was 14 years of age, and the other students were 12 or 13 years old.

Students participated on the basis of their availability on the day of the survey. Students were not matched with the stores they visited at baseline and follow-up with respect to age, appearance, or gender. All students were African American.

Several weeks following completion of the baseline survey, a press conference announcing the results of the survey received coverage in 3 of 4 New York daily newspapers and on 4 of 7 local television stations. The press conference described the results for enforcement stores only, since the lead sponsor of the conference was the New York City Department of Consumer Affairs, the agency responsible for fining stores in violation of the law. The press conference did not mention the other groups of stores or make reference to the overall study design.

The SPSS-PC statistical package<sup>30</sup> was used in entering and analyzing data from the surveys. Analysis of variance was performed to detect differences in tobacco sales among the 3 groups of stores at baseline. Multivariate analysis of variance (MANOVA) with repeated measures was used to analyze differences in tobacco sales (individual and overall) by group and time period.<sup>31</sup> MANOVAs test for group differences while accounting for the intercorrelation of repeated measures; thus, they were appropriate for assessing changes among the store groups over time. Although the study data were categorical, we were able to use a normal distribution model because the analysis involved comparisons of differences in means in samples of reasonably large size.<sup>32</sup>

The McNemar chi-square test<sup>33</sup> was used to determine whether sales of tobacco significantly declined over time within each group. Sales of cigarettes (both individual

and overall) between baseline and 6-month follow-up and between baseline and 1-year follow-up were compared.

## Results

Results at baseline demonstrated an unusually high prevalence of illegal tobacco sales to minors. More than 2 of every 3 stores (70%) sold loose or single cigarettes, and 98% of the 152 stores sold either a single cigarette or a pack of cigarettes.

As shown in Table 1, at the 6-month follow-up, single cigarette sales declined 16% among control stores (from 67% to 51%), 34% among education stores (from 69% to 35%), and a substantial 56% among enforcement stores (from 76% to 20%). At 1-year follow-up, the declines in single cigarette sales in comparison with baseline were similar: 18% among control stores (from 67% to 49%), 44% among education stores (from 69% to 25%), and 58% among enforcement stores (from 76% to 18%).

Single cigarette sales among the 3 groups of stores at baseline were not significantly different ( $P = .63$ ), but there were significant differences among the 3 groups of stores over time. When change in single cigarette sales within store groups was compared, the control group stores demonstrated no significant change over time, but the education and enforcement group stores both demonstrated significant declines from baseline to 6 months ( $P < .01$ ) and from baseline to 1 year ( $P < .01$ ).

As shown in Table 1, the findings for overall tobacco sales (either single cigarette or pack) were similar to those for individual cigarette sales. At the 6-month follow-up, overall tobacco sales declined only 8% among control stores (from 95% to 87%) and only 10% among education stores (from 100% to 90%), but sales decreased 45% among enforcement stores (from 100% to 55%). At 1 year, overall tobacco sales in comparison with baseline demonstrated a similar decline among control stores (6%), a somewhat greater decline among education stores (23%), and a substantial decline among enforcement stores (53%).

Comparisons of overall tobacco sales among the 3 groups of stores were not statistically significantly different at baseline ( $P = .07$ ) but differed significantly over time. Similarly, when change in overall tobacco sales within store groups was evaluated, the control group stores demonstrated no significant change over time. However, both the education group stores and the enforcement group stores showed declines in total sales from baseline to 6 months,

**TABLE 1—Percentage of Stores Selling Single Cigarettes or Packs of Cigarettes to Minors in Central Harlem, New York, 1993/94**

Time Period	Total Stores (n = 152)	Intervention Type		
		Control (n = 55)	Education (n = 48)	Enforcement (n = 49)
<b>Sales of single cigarettes</b>				
Baseline	70.4	67.3	68.8 <sup>a,b</sup>	75.5 <sup>a,b</sup>
6-month follow-up	36.2	50.9	35.4 <sup>a</sup>	20.4 <sup>a</sup>
1-year follow-up	31.6	49.1	25.0 <sup>b</sup>	18.4 <sup>b</sup>
<b>Sales of single cigarettes or packs</b>				
Baseline	98.0	94.5	100.0 <sup>b</sup>	100.0 <sup>a,b</sup>
6-month follow-up	77.6	87.3	89.6	55.1 <sup>a</sup>
1-year follow-up	71.7	89.1	77.1 <sup>b</sup>	46.9 <sup>b</sup>

Note. All single cigarette sales are illegal, regardless of age of purchaser.

<sup>a</sup>Percentage of sales of single cigarettes or sales of single cigarettes or packs differed significantly within intervention type between baseline and 6-month follow-up (McNemar  $\chi^2$  test,  $P < .05$ ).

<sup>b</sup>Percentage of sales of single cigarettes or sales of single cigarettes or packs differed significantly within intervention type between baseline and 1-year follow-up (McNemar  $\chi^2$  test,  $P < .05$ ).

along with greater declines from baseline to 1-year follow-up.

## Discussion

Reducing the prevalence of smoking initiation among youth has become a major national issue. Recent trends demonstrating increased youth tobacco use<sup>6</sup> underscore the need for effective strategies to help prevent future generations from becoming addicted to nicotine-containing products.

The rationale for reducing or eliminating accessibility to tobacco through retail stores has several bases. Recent data indicate that the most common source of cigarettes for students less than 18 years of age is a store (39%), exceeding other means such as borrowing cigarettes from someone else (33%), giving someone else money to buy cigarettes (16%), stealing them (4%), or obtaining them from vending machines (2%).<sup>6</sup> The widespread availability of individual or loose cigarettes (usually sold at 15 to 25 cents each) demonstrated in this study increases the accessibility of tobacco to children who possess little disposable income. Finally, the public appears to support enforcement strategies. A survey of adults in 1989 showed that, among 10 communities surveyed, 77% to 93% of respondents believed that merchants who sell tobacco to minors should be fined.<sup>34</sup>

Baseline data from this study demonstrate an unusually high prevalence of tobacco sales to minors in central Harlem, exceeding the percentage of tobacco sales to minors reported by each of the 13 studies cited in the 1994 surgeon general's report.<sup>3</sup> The accessibility of tobacco to 12- and 13-

year-old youth in Harlem is a distressing finding in a community with sharply excess mortality from smoking-related causes, including cardiovascular disease and cancer.<sup>29</sup> Although African-American adolescents smoke at lower rates than White adolescents, recent data indicate disproportionate increases in smoking among Black youth.<sup>6</sup> Further study is needed to document the accessibility of both single cigarettes and packs of cigarettes in a wider variety of communities.

Two basic approaches exist for increasing compliance by retailers with laws prohibiting tobacco sales to minors: education and enforcement of existing laws. Results from this study demonstrate a clear benefit of the enforcement strategy. The relatively modest effects of the educational visit were significantly exceeded by "laying down the law" to merchants through the administration of fines.

There are several limitations to this study that may preclude its generalizability. The single educational visit may not have been sufficient to effectively alter the behavior of retailers in the education group. The publicity achieved by the press conference following the baseline survey may have contaminated the control group stores to some extent, although this would be expected to dilute any effects found. It is also possible that the publicity amplified the education and enforcement interventions and enhanced their impact, a possibility that was not controlled for in the analysis. The study did not control for age, gender, or appearance of the student volunteers, and we were not able to assess whether student appearance may have influenced the results. Finally, the relatively brief intervals between

surveys may not have been sufficient to test lasting effects of the enforcement strategy.

The addictive nature of nicotine, early initiation of tobacco use, and substantial mortality associated with that use have led to intense efforts to develop effective methods to reduce tobacco initiation among youth. This study demonstrates a reduction of illegal sales of tobacco through enforcement beyond that produced by an educational visit. Although attempts to restrict accessibility of tobacco should not be the sole approach to controlling tobacco use among the young,<sup>35</sup> effective strategies to reduce access to tobacco by children and adolescents are an important component of any comprehensive approach to tobacco control.

Reducing tobacco initiation among our nation's youth has become a critical public health issue. Results from this study suggest that communities that initiate and maintain strategies in which merchants who violate the law are fined are more likely to be successful in the fight to keep tobacco out of the hands of their children. □

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## Call for Abstracts for Epidemiology Late-Breaker Sessions

### Oral Exchange Session

The Epidemiology Section will sponsor a late-breaker epidemiology oral exchange session on Wednesday, November 18, 1998, during the American Public Health Association's 1998 Annual Meeting in Washington, DC. The exchange will provide a forum for oral presentation of investigations, analyses, or methods that have been conceived, conducted, and/or completed after the February 10, 1998, deadline for regular submission to other epidemiology sessions.

Abstracts of fewer than 250 words (any format) and a stamped, self-addressed return envelope should be submitted to Laura J. Fehrs, MD, Acting Chief, State Branch, Division of Applied Public Health Training, EPO, Centers for Disease Control and Prevention, Mailstop D-18, 1600 Clifton Rd, Atlanta, GA 30333; tel (404) 639-2110; fax (404) 639-4504; email: ljf2@cdc.gov.

Abstracts must be received by *September 11, 1998*. Decisions will be made by October 2, 1998.

### Poster Session

The Epidemiology Section will again sponsor a late-breaker poster session on Wednesday, November 18, 1998, at the APHA Annual Meeting in Washington, DC. This session permits the presentation of work that has been completed too late in the last year for regular paper submission. Abstracts should report on work conducted during the past year.

Along with a stamped, self-addressed return envelope, abstracts of less than 250 words (any format) should be submitted to Elizabeth Barrett-Connor, MD, Department of Family and Preventive Medicine, University of California, San Diego, 9500 Gilman Dr, La Jolla, CA 92093-0607; tel (619) 534-0511; fax (619) 534-8625; email: ebarrettconnor@ucsd.edu.

Abstracts must be received by *September 11, 1998*. Decisions will be made by October 2, 1998.