Minors’ access to tobacco before and after the California STAKE Act

Hope Landrine, Elizabeth A Klonoff, Astrid Reina-Patton

Abstract
Objective—To assess the effect of implementation and enforcement of the California STAKE Act on minors’ access to tobacco by examining sales over time in the same stores.

Design—Sixteen year old girls and boys attempted to purchase cigarettes in the same 72 stores, in the same manner, in five time periods: August 1994 (before implementation of legislation); August 1995 (immediately after implementation); August 1996; March 1998; and January 1999 (all postimplementation).

Outcome measure—Percentage of successful cigarette purchases over time, in different ethnic communities.

Results—Minors’ access rate decreased significantly from 41.2% before implementation of legislation (1994) to 12.7% after implementation (1998). The same stores were 3–5 times more likely to sell cigarettes to minors before than after the legislation was implemented, irrespective of ethnic census tract.

Conclusions—The California STAKE Act and its enforcement have been effective in reducing minors’ access to tobacco in all ethnic communities.

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Keywords: minors’ access, STAKE Act, ethnicity

In the late 1980s and early 1990s, children aged 12–17 years were successful at purchasing cigarettes 60–90% of the time,1,4 and purchased approximately 1 billion packs of cigarettes each year4 despite laws banning the sale of tobacco to minors.3,5 Clearly, more comprehensive policies were needed to reduce minors’ access. Three such policies were implemented in 1994-96: the Synar Regulation,6 the Food and Drug Administration (FDA) regulation RIN 0910-AA48,10 and the California STAKE Act.11 The Synar and FDA policies require all states (as of January 1996) to enforce youth access laws, develop plans to decrease sales of tobacco to children to ≤ 20%, and to provide documentation of that to the Substance Abuse and Mental Health Services Administration (SAMSHA). A state can lose up to 40% of its federal substance abuse prevention and treatment block grant funds for failure to comply with Synar. In California, compliance with Synar consisted of passing the Stop Tobacco Access to Kids Enforcement (STAKE) Act in 1994 (implemented in 1995). The STAKE Act requires the California Department of Health Services Tobacco Control Section (TCS) to (among other things) implement an intense, statewide enforcement program to decrease tobacco sales to youth to ≤ 20% of their purchase attempts; conduct regular “sting operations” in stores throughout the state; and assure that California meets all of the requirements of Synar.11

Data on the effectiveness of Synar were provided by SAMSHA in 1998.12 SAMSHA compared studies of minors’ access rates before the Synar legislation to studies of their rates post implementation of Synar (that is, results from the 1997 block grant applications). SAMSHA found prelegislation access rates of 60–90%, and postimplementation access rates of 31–50% in most states, with 25% of states sampled reporting rates of 30% or less.12 Although SAMSHA’s findings are encouraging, they are problematic because the studies compared by SAMSHA were conducted in different communities, stores, and types of stores, by investigators who utilised significantly different methodologies.2 Observed decreases in youth access to tobacco thereby may not be a function of the legislation but instead an artifact of using different stores, types of stores, and methodologies. To assess the effectiveness of Synar, minors’ access to tobacco must be assessed in the same national set of stores, using a single methodology, pre- and post-Synar. No such study exists.

Likewise, the California Department of Health Services TCS annually collects statewide data on the effectiveness of the STAKE Act. These “youth purchase surveys” are conducted by the authors (EK) and indicate a steady decline in youth access to tobacco in California—that is, from 37% in 1995 (when STAKE took effect), to 29.3% (1996), to 21.7% (1997), to 13.1% in 1998.13 Although these findings appear to suggest that the STAKE Act has been effective, there are two reasons that these data cannot be interpreted as such. The first is that TCS youth purchase surveys are never conducted in the same stores; rather, a new, random collection of stores is used each year as required by SAMSHA. This makes it difficult to know if the observed annual decreases are the result of the legislation and its enforcement, or are an artifact of using different stores. The second problem is that many of the stores included in TCS youth purchase surveys have participated in merchant education interventions conducted by TCS, making it difficult to know if the observed decreases are caused by the law and its enforcement or are the result of educat-
Table 1 Percentage of packs of cigarettes sold to minors over time

<table>
<thead>
<tr>
<th>Time Period</th>
<th>White</th>
<th>Black</th>
<th>Latino</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1, 1994</td>
<td>41.2%</td>
<td>38.9%</td>
<td>45.5%</td>
<td>36.5%</td>
</tr>
<tr>
<td>Time 2, 1995</td>
<td>32.3%</td>
<td>35.6%</td>
<td>37.5%</td>
<td>35.6%</td>
</tr>
<tr>
<td>Time 3, 1996</td>
<td>34.7%</td>
<td>36.5%</td>
<td>37.5%</td>
<td>36.5%</td>
</tr>
<tr>
<td>Time 4, 1998</td>
<td>12.7%</td>
<td>28.1%</td>
<td>40.6%</td>
<td>28.1%</td>
</tr>
<tr>
<td>Time 5, 1999</td>
<td>15.2%</td>
<td>14.9%</td>
<td>11.5%</td>
<td>14.9%</td>
</tr>
</tbody>
</table>

Overall $\chi^2 = 197.44, p = 0.0005$; time 1 $\times$ time 2 $\chi^2 = 5.85, p = 0.016$; time 2 $\times$ time 3 $\chi^2 = 0.36, p = 0.54$; time 2 $\times$ time 4 $\chi^2 = 56.02, p = 0.0005$; time 4 $\times$ time 5 $\chi^2 = 2.10, p = 0.15$. Analyses of differences by time period:

- Time 1 and 2: $\chi^2 = 17.52, p = 0.0005$.
- Time 1 and 3: $\chi^2 = 18.59, p = 0.0005$.
- Time 1 and 4: $\chi^2 = 1.53, p = 0.22$.
- Time 1 and 5: $\chi^2 = 31.19, p = 0.0005$.
- Time 2 and 3: $\chi^2 = 1.39, p = 0.24$.
- Time 2 and 4: $\chi^2 = 34.71, p = 0.0005$.
- Time 2 and 5: $\chi^2 = 23.34, p = 0.0005$.
- Time 3 and 4: $\chi^2 = 26.80, p = 0.0005$.
- Time 3 and 5: $\chi^2 = 10.13, p = 0.001$.
- Time 4 and 5: $\chi^2 = 8.41, p = 0.004$.

PURCHASE ATTEMPTS

As in the 1993-95 study, all purchase attempts transpired from 3 pm to 7 pm on weekdays, and minors were paid for each purchase attempt irrespective of its success. The purchase attempts in each time period transpired over 2–3 months. In each time period, each minor visited each store once to make a purchase attempt. There were 432 purchase attempts in time period 1 (6 minors × 72 stores), 288 purchase attempts in time periods 2 and 3 (4 minors × 72 stores), and 828 purchase attempts in time periods 4 and 5 (12 minors × 69 of 72 stores, because three stores went out of business), for a total of 2664 purchase attempts. Purchase attempts were scheduled so that stores were visited by only two to three minors from the study each week. Purchase attempts were one hour to three days apart. Each child entered the store, went to the counter and asked, “May I have a pack of Marlboros, please?”. Minors were provided with funds for the purchase, and all tobacco was confiscated from them after a successful purchase attempt.

Table 2 Percentage of packs of cigarettes by neighbourhood over time

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>39.3%</td>
<td>35.4%</td>
<td>11.5%</td>
<td>15.1%</td>
<td>Time 1 $\times$ time 2 $\times$ time 3 $\times$ time 4 $\times$ time 5</td>
</tr>
<tr>
<td>Black</td>
<td>38.9%</td>
<td>36.5%</td>
<td>14.9%</td>
<td>13.9%</td>
<td>ns, not significant.</td>
</tr>
<tr>
<td>Latino</td>
<td>45.5%</td>
<td>40.6%</td>
<td>11.5%</td>
<td>16.6%</td>
<td>ns, not significant.</td>
</tr>
</tbody>
</table>

Within tract over time effects:

- White tracts: $\chi^2 = 7.05, p = 0.008$; time 1 $\times$ time 2 $\chi^2 = 0.373, p = 0.54$; time 1 $\times$ time 4 $\chi^2 = 41.92, p = 0.0005$; time 1 $\times$ time 5 $\chi^2 = 29.69, p = 0.0005$.
- Black tracts: $\chi^2 = 3.63, p = 0.06$; time 1 $\times$ time 2 $\chi^2 = 7.23, p = 0.007$; time 1 $\times$ time 3 $\chi^2 = 2.99, p = 0.08$; time 1 $\times$ time 4 $\chi^2 = 26.80, p = 0.0005$.
- Latino tracts: $\chi^2 = 1.53, p = 0.22$; time 1 $\times$ time 2 $\chi^2 = 20.62, p = 0.0005$; time 1 $\times$ time 3 $\chi^2 = 23.34, p = 0.0005$; time 1 $\times$ time 4 $\chi^2 = 8.41, p = 0.004$.

RESULTS

Tables 1 and 2 present $\chi^2$ analyses. As shown in table 1, minors’ access rate in 1994 (before implementation) was 41.2%. This decreased significantly to 32.2% one year later (time 2, 1995) when the STAKE Act was implemented. Minors’ access rate then
remained stable (time 3, 1996), then decreased significantly during the next 12–18 months (time 4, 1998) to 12.7%, and remained low thereafter (time 5, 1999, 15.2%). This decrease occurred in all ethnic communities (table 2), but appears (in the $\chi^2$ analyses at least) to have occurred more quickly (that is, at time 2) in white than in minority communities (row analyses table 2); access in all communities, however, was the same (column analyses, table 2) irrespective of time period.

To clarify these findings, stepwise and hierarchical logistic regressions were conducted, predicting sale versus no sale from time period and census tract (table 3). In the stepwise analysis, time period was the only predictor selected; the same 72 stores were 3–4 times more likely to sell cigarettes to minors before than after implementation of the STAKE Act. Results for the hierarchical regression were the same, with no significant effect for ethnic neighbourhood.

**Discussion**

Minors attempted to purchase cigarettes in precisely the same 72 stores, in exactly the same manner, in five time periods, each time period separated by about a year. One of the time periods was before implementation of the STAKE Act and the remainder were after implementation. Results revealed that minors’ access decreased significantly after implementation of the STAKE Act and then continued to decrease over time. These decreases cannot be attributed to interventions with merchants because this set of stores has been excluded from those. Likewise, the decreases cannot be attributed to using different stores each year, because the same stores were used; similarly, the decreases cannot be attributed to the status characteristics of the minors because all minors in all time periods were 16 years old, were half girls and half boys, and were matched for size and appearance. Hence, it is reasonable to conclude that these decreases in minors’ access are the result of the California STAKE Act and its enforcement. These findings suggest that passing and enforcing local youth access policies can reduce youth access to tobacco.

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### Table 3 Stepwise and hierarchical logistic regressions predicting sold versus not sold from time period and neighbourhood

<table>
<thead>
<tr>
<th>Stepwise regression</th>
<th>Coefficient</th>
<th>Coefficient/SE</th>
<th>Odds ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1: August, 1994</td>
<td>1.372</td>
<td>9.97</td>
<td>3.94</td>
<td>3.01, 5.17</td>
</tr>
<tr>
<td>Time 2: August, 1995</td>
<td>0.986</td>
<td>6.20</td>
<td>2.68</td>
<td>1.96, 3.66</td>
</tr>
<tr>
<td>Time 3: August, 1996</td>
<td>1.096</td>
<td>6.97</td>
<td>2.99</td>
<td>2.19, 4.07</td>
</tr>
<tr>
<td>Time 4: March, 1998</td>
<td>-0.206</td>
<td>1.45</td>
<td>0.814</td>
<td>0.616, 1.076</td>
</tr>
<tr>
<td>Hierarchical regression</td>
<td>Coefficient</td>
<td>Coefficient/SE</td>
<td>Odds ratio</td>
<td>95% CI</td>
</tr>
<tr>
<td>Step 1: time period</td>
<td>Reference group: time 5 (January 1999)</td>
<td>1.372</td>
<td>9.97</td>
<td>3.94</td>
</tr>
<tr>
<td>Time 1: August, 1994</td>
<td>1.089</td>
<td>6.93</td>
<td>2.97</td>
<td>2.18, 4.04</td>
</tr>
<tr>
<td>Time 2: August, 1995</td>
<td>-0.206</td>
<td>1.45</td>
<td>0.814</td>
<td>0.616, 1.076</td>
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<td>0.814</td>
<td>0.616, 1.076</td>
</tr>
<tr>
<td>Step 2: neighbourhood</td>
<td>Reference group: white</td>
<td>0.086</td>
<td>0.716</td>
<td>1.09</td>
</tr>
<tr>
<td>Black</td>
<td>0.222</td>
<td>1.87</td>
<td>1.25</td>
<td>0.99, 1.58</td>
</tr>
</tbody>
</table>

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