Does a minimum-age law for purchasing tobacco make any difference? Swedish experiences over eight years

M. Sundh\textsuperscript{1}, C. Hagquist\textsuperscript{2}

\textbf{Background:} The purpose was to study possible changes in adolescents’ opportunities for purchasing tobacco during the period 1996–2005. The study also investigated regional differences in adolescents’ opportunities for purchasing tobacco, and elucidated the efforts by the authorities to affect the compliance with the minimum-age law of 18. \textbf{Methods:} In 1996, 1999, 2002, and 2005, 3150 test purchases of tobacco were conducted in controlled forms by 48 adolescents in three regions of Sweden. In addition, in 2005, 28 structured telephone interviews were conducted with key people in tobacco prevention work. \textbf{Results:} In 1996, 84\% of all test purchases in shops with a voluntary age-limit ended with the test purchasers succeeding in purchasing tobacco. This may be compared with 48\% in 2005, 8 years after the age-limit law was introduced. The result of the test purchases and of the interviews showed differences between the three regions in compliance and in activities connected with the minimum-age tobacco law. \textbf{Conclusions:} The study shows that the minimum-age law for the purchase of tobacco has had an effect on adolescents’ opportunities for purchasing tobacco and that compliance has improved since its introduction in 1997. The result also indicates avenues for further improving compliance with the age-limit law.

\textbf{Keywords:} adolescents, minimum-age law, tobacco

I\textsubscript{n} 1998 Sweden became the first country in Europe to reach the WHO goal that the proportion of daily-smokers in the population (ages 16–84 years) should be under 20\%. New national goals formulated in 2002 state that the number of adolescents under 18 years who start to use tobacco is to be halved by 2014. Converted into prevalence rates, this implies a reduction in the proportion of 15–16-year-olds who smoke daily,\textsuperscript{1} from 9 to 4.5\% among boys and from 15 to 7.5\% among girls.

Legislation is an important element in tobacco prevention in Sweden, where tobacco legislation is based on a number of strategies seeking to reduce commercial access to tobacco. In what follows, these strategies are presented with a conceptual approach previously used by Forster and Wolfson:\textsuperscript{2}

- \textbf{Restrictions on distribution.} The Swedish Tobacco Act contains a prohibition on distributing free tobacco to minors. Tobacco companies, importers of tobacco products or wholesalers, may not support events to which the public has entry.

- \textbf{Regulation of means of sale.} The Tobacco Act includes provisions that there must be signs regarding the age-limit at locations where tobacco is sold. In addition, tobacco vending machines must be placed so that age control is possible.

- \textbf{Regulation of seller.} In 1973 the National Board of Health and Welfare in Sweden proposed a minimum-age law of 18 years for purchasing tobacco. However, a statutory age-limit was not introduced until 1997. The age-law stipulates that tobacco may not be sold to those who are under 18 years of age. Those who sell tobacco shall ensure that the recipients have reached the stated age. The statutory limit was preceded in 1996 by a voluntary age-limit of 18 years among some of the larger supermarket chains. National and municipal authorities are responsible for compliance with the law. Powers exist to impose fines or prison for a maximum of 6 months on a seller of tobacco products who repeatedly breaks the law.

- \textbf{Regulation by buyer.} There are no laws of this type in Sweden.

Although all of the Nordic countries have a minimum-age law for purchasing tobacco only a few Nordic studies have been carried out concerning the effect of age laws on adolescents’ access to tobacco. In Norway, where a minimum-age law of 18 years was introduced in 1996, difficulties have been reported as regards the compliance with the law.\textsuperscript{3} A study from Finland\textsuperscript{4} in which country a 16-year-age-limit law for tobacco purchase was introduced in 1977, to be raised to 18 years in 1995, shows that chiefly youths between 14 and 16 have found it more difficult to purchase tobacco in shops following the introduction of the minimum-age law. In Sweden, too, the 18-year-age-limit has made it more difficult for adolescents to purchase tobacco.\textsuperscript{5} Poor age control, however, negatively affects the effectiveness of the age-law. Models for improving compliance have been developed, however, and evaluated in the USA and other places. A study (Wilday \textit{et al.})\textsuperscript{6} shows that minors opportunities for purchasing tobacco are limited if tobacco products are stored in the shop in such a way that customers are obliged to ask the assistant for the product they wish to purchase. Another way of improving compliance is to not permit minors to sell tobacco.\textsuperscript{2}

The purpose of the present study was to elucidate:

- possible changes in adolescents’ opportunities for purchasing tobacco during the period 1996-2005,
- regional differences in adolescents’ opportunities for purchasing tobacco during the same period, and
- the efforts by the authorities in order to affect the compliance with the minimum-age law.
Methods

The present paper contains data from two different types of collection: test purchases of tobacco and interviews with key persons working on tobacco prevention/control of the minimum-age law. Test purchases were carried out in 1996, 1999, 2002, and 2005 in three regions of Sweden: the city of Malmö (267,000 inhabitants) in southern Sweden which is the third largest city in Sweden and located across the Sound some kilometres from Copenhagen; the rural county of Västernorrland (244,000 inhabitants) in mid-northern Sweden which is located 1000 km northeast of Malmö; Värmland county (273,000 inhabitants) which is in mid-southern Sweden and is located ~500 km north of Malmö and Västernorrland. These areas were chosen in order to include regions at different geographical locations. Interviews were conducted in 2005 in these three regions.

Test purchases of tobacco

The method used for the test purchases of tobacco is based largely on a method developed in Finland\(^7\) which in turn was influenced by a method developed in the USA.\(^8\)

The 1996 test purchasers, who were under 18 years, were recruited with help from non-governmental organisations. Since the test purchasers were minors, written permission was required from their parents for them to take part. In 1999, 2002, and 2005 the test purchasers were recruited through advertising at upper-secondary schools in each region. Adolescents aged 18 years or just over were invited to apply. The test purchasers, who participated after the introduction of the minimum-age law, were in fact 18 years of age or just over, since the use of test purchasers under 18 years is not in accordance with Swedish law. A panel in each region consisting of representatives of five occupations (upper-secondary-school teacher, police, school nurse, cashier, and door security guard) who often come into contact with adolescents in their work then met the boys and girls and assessed their ages in writing. The panel members made their assessments individually. The method used for assessing the adolescents’ age was developed in a study\(^9\) intended to determine the extent to which adolescents are asked to present identification when they order strong beer at restaurants. For the 2005 test purchase study the method for assessing adolescents’ ages was refined in that the panel estimated the age of each boy and each girl twice. Between the two assessments the results were collected so that the panel members could not check how they had estimated the adolescents’ ages the first time. On the basis of the estimates, the adolescents with the lowest/youngest appearance were finally selected to take part as test purchasers. No consent from their parents was required since the test purchasers were of the age of 18 or older. The test purchasers received a small sum of money as compensation for their work.

Before the test purchases were conducted, the test purchasers were trained in how they should handle situations and questions that could conceivably arise during the purchases. For the test purchases a boy or a girl entered a shop alone and attempted to purchase a tobacco product. 85% of all test purchases comprised cigarettes and 15% Swedish snuff. The test purchasers were provided with money in advance. The test purchasers were allowed only to purchase tobacco and they were not allowed to have any form of identification with them to use for proving their age. The test purchasers themselves chose the brand of tobacco product. Purchase attempts were made in supermarkets, food stores, after-hours supermarkets, newsagents, petrol stations, etc. There were too few test purchasers to target all municipalities in the regions. In Värmland 11 of 16 and in Västernorrland 5 of 7 municipalities were targeted. For the same reasons, not all districts in Malmö were covered. No complete registers of tobacco sales outlets were available but the strategy was to visit all outlets that were recognised in the municipalities and districts targeted. After each test purchase the test purchasers completed a checklist with questions such as whether signs were up about the minimum-age law and whether the cashier asked to see identification. Purchased tobacco products were taken care of immediately by the co-ordinator after each test purchase. The shops where the purchases were made were not informed, either beforehand or afterwards. The co-ordinator was the same person in all test purchases for all years and in all regions. For a more detailed description of the method for conducting the test purchases, reference is made to earlier studies.\(^5\)

Age, gender and other particulars of the test purchasers are shown in table 1.

Table 1 shows that two boys and two girls took part in all test purchase series in each region. No assessment was made of whether the appearance of the test purchasers in 1996 corresponds to their actual ages. Since very few adolescents in 1999 were interested to participate, only test purchasers with a somewhat older appearance were recruited in Värmland (boys and girls) and in Malmö (boys). Corresponding problems existed in Västernorrland in 2002 (boys).

Interviews

In 2005, data was also collected using structured telephone interviews in all the municipalities/city districts where test purchases had been carried out that year. The purpose of the interviews was to gain a picture of how tobacco prevention was being run. Interviews were conducted with one person responsible at each county administrative board and with a person in each region responsible for tobacco issues and contacts with the National Institute of Public Health. Six interviews in total were conducted at regional level. In addition, 22 interviews were conducted at municipal level with people responsible for supervision of how the trade is complying with the minimum-age law for tobacco purchase.

Similar questions were asked in the interviews at regional and local levels. The interviewees were asked what was planned and what had been done for tobacco prevention particularly concerning the age law.

Each interview took on average 15 min and the interviewees’ answers were recorded during the interview using computers.

Analysis of data from the test purchases

The result of the analyses reported in table 2 were refined by including, for 1996, only data from test purchases in shops with a voluntary age-limit. In total, 536 test purchases made in shops without a voluntary age-limit were excluded. For 1999, 2002, and 2005 all the test purchases were included.

In the analysis underlying table 3, the following inclusion and exclusion criteria were applied:

- Only test purchases made in shops with a voluntary age-limit was included in 1996.
- Only test purchases made by test purchasers with an estimated age of <18.0 years were included which means that in total 498 test purchases were excluded 1999 and 2002.
- 75 test purchases made in Värmland in 2005 made by a girl with an estimated age of 15.5 years were excluded. The same year 75 test purchases in Västernorrland made by a boy who could not participate in the test purchases on all days were excluded.
- Test purchases made in municipalities that were not involved for all years were excluded which means that in total 230 test purchases were excluded during 1996–2005.
Thus the total number of test purchases that were excluded in table 3 were 1414 and in totally 1736 test purchases distributed over 4 years and three regions are reported.

The data from the test purchases were analysed by means of SPSS, version 14.0. The Z-test for differences in proportions was used to test differences across different years and regions in tables 2 and 3.

**Analysis of interview data**

Table 4 shows results from the structured telephone interviews. Based on content analysis of the interviews, the data from the individual questions were ‘manually’ summarised as follows: Under the heading ‘activities aimed to improve compliance with a minimum-age law’ the answers to three questions on what the municipalities/city districts did are reported. One question was about whether planned visits to shops selling tobacco were undertaken to give information/control regarding questions on the minimum-age law and another question whether test purchases organised by the local authorities had been made. The third question was whether the municipality/city district arranged courses for the trade regarding the minimum-age law for the purchase of tobacco. The answers to these questions have been summarised in three categories: ‘very active work’ signifies that the interviewee answered at least two of the three above questions affirmatively, ‘active work’ means that the interviewee answered one question affirmatively and ‘non-active’ means that the interviewee answered all the questions in the negative.

**Results**

**Results from the test purchases**

Table 2 shows by region the proportions of test purchases that ended with the test purchasers being allowed to purchase tobacco.

Table 2 shows that the voluntary age-limit existing in 1996 had only a limited effect on test purchasers’ opportunities for purchase of tobacco.
The table shows that in 1999 it was still easy for the test purchasers to purchase tobacco. In Värmland it was even easier to purchase tobacco in 1999 compared with 1996. In 2002, compared with 1996 and 1999, it was in total significantly more difficult for the test purchasers to purchase tobacco even if they succeeded in the large majority of cases. In 2005, it was in Värmland and Västernorrland significantly more difficult to purchase tobacco compared with earlier years.

Table 3 reports the proportion of test purchases that ended with purchases. Overall there was a reduction in the proportion of test purchases ending in purchases in 2002 compared with 1999.

Differences in the outcomes of test purchases in 2005 between Malmö and Värmland and Västernorrland are statistically significant (P ≤ 0.001). This is not marked in the table. In Värmland in 2005 it was significantly harder to purchase tobacco than in 2002. The total results shown for all test purchases irrespective of region show a significant decline year-by-year in opportunities for purchasing tobacco.

**Results of the interviews**

Table 4 shows the result of the telephone interviews. The table shows that at regional levels in Malmö and Västernorrland there was active work using e.g. courses and information to support municipalities so that they could adequately supervise the trade with respect to the minimum-age law. The National Institute of Public Health was highlighted in several interviews at regional level as an important co-operation partner in tobacco prevention (not shown in the table).

The interviews showed differences in how the municipalities/city districts worked on tobacco prevention. In Malmö checks on the age-law were planned by a central unit, which meant that all city districts worked in similar ways to monitor
Table 3 Outcome of reduced number of test purchases distributed by region, within regions and by year\(^a\) (a description of the criteria for inclusion and exclusion of test purchases, see the method section)

<table>
<thead>
<tr>
<th>Region</th>
<th>1996</th>
<th>1999</th>
<th>2002</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>Allowed to purchase (%)</td>
<td>(n)</td>
<td>Allowed to purchase (%)</td>
</tr>
<tr>
<td>Malmö</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>79</td>
<td>125</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Värmland</td>
<td>64</td>
<td>81</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The city of Karlstad</td>
<td>38</td>
<td>82</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other participating municipalities in Värmland</td>
<td>26</td>
<td>81</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Västernorrland</td>
<td>63</td>
<td>89</td>
<td>211</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The city of Sundsvall</td>
<td>33</td>
<td>85</td>
<td>123</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other participating municipalities in Västernorrland</td>
<td>30</td>
<td>93</td>
<td>88</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Results from all test purchases</td>
<td>156</td>
<td>84</td>
<td>336</td>
<td>73</td>
</tr>
</tbody>
</table>

\(a\): Only comparisons that show significant \(P\) values have marked in the table.
Level of significance **\(P \leq 0.01\); ***\(P \leq 0.001\); *\(P \leq 0.05\)
compliance with the age-law. Since 2002 the Malmö city districts had been very active in their endeavours to improve compliance with the age-law, employing both test purchasing and planned visits to shops. In Värmland and Västernorrland monitoring of, and support to, shops selling tobacco were planned and implemented in each municipality. In the city of Karlstad in Värmland, a project had been started some months before the interviews took place to get shops to apply the minimum-age law for sales of medium-strength beer and tobacco better. Direct work planned in the form of courses and test purchases, however, had not started at the time of the interviews. Visiting shops selling tobacco was the activity most municipalities in Västernorrland and Värmland conducted, or planned, to attempt to persuade shopkeepers to improve compliance with the age-law. Some municipalities (Kramfors, Sollefteå, and Karlstad) conducted or planned to carry out test purchasing. Karlstad, Härnösand, and Örnsköldsvik municipalities either conducted or planned to conduct courses for shopkeepers.

**Discussion**

The study showed that the statutory minimum-age law for the purchase of tobacco affects adolescents’ opportunities of purchasing tobacco, and that compliance with the law has improved over time, but slowly. In 1996, 84% of all test purchases in shops with a voluntary age-limit ended with the test purchasers being allowed to purchase. In 2005, i.e. 8 years after the introduction of the minimum-age law, the test purchasers managed to purchase at 48% of their attempts. In Malmö, there was a relatively steady improvement in test purchase results from year to year. In Västernorrland the largest improvement was between 1999 and 2002, and in Värmland between 2002 and 2005. In 2005 it was significantly easier for the test purchasers in Malmö to purchase tobacco than it was for those in Värmland and Västernorrland.

The fact that improvements in compliance with the age-law took place later in Värmland, compared with the other regions, is likely to reflect that local activities were initiated later in Värmland than in the other regions, in fact not until 2004/2005.

After the introduction of the minimum-age law the tobacco legislation has been tightened up step-by-step. For example since 2002 there are rules that shops selling tobacco are obliged to notify this to the municipality in which the sales take place. The municipalities are entitled to take a charge upon the shops to cover part of the costs of supervision. There are now also clearer rules to govern displays regarding the age-law. Also, the interviews show that many municipalities/city districts did not start their monitoring until several years after the law came into force. In fact most of the municipalities and city districts did not start their efforts to improve compliance with the minimum-age law until the possibilities to put a charge on the shops that sell tobacco was introduced.

For a statutory minimum-age law to succeed in limiting access to tobacco among adolescents, such access via other, non-commercial, routes must also be counteracted. Studies show\(^{10,11}\) that in communities with a well-functioning age-law at the same time non-commercial access also declines. Studies also show that heavy smokers are the ones who are most inclined to give away or sell cigarettes to others since they have the greatest access to cigarettes.\(^{12}\) Other attempts to change

<table>
<thead>
<tr>
<th>Municipality/region</th>
<th>Activities aimed to improve compliance with a minimum-age law for the purchase of tobacco</th>
<th>Time point at which efforts to improve compliance with the minimum-age law for the purchase of tobacco started</th>
</tr>
</thead>
<tbody>
<tr>
<td>The region of Skåne</td>
<td>Very active with many different projects, epidemiological surveillance and courses directed to the city districts. Efforts to improve compliance with the age-law planned centrally by licensing authorities.</td>
<td></td>
</tr>
<tr>
<td>Malmö city districts</td>
<td>Very active work</td>
<td>2002</td>
</tr>
<tr>
<td>The county of Värmland</td>
<td>No regional work to improve compliance with the age-law. Work on support to stop smoking.</td>
<td></td>
</tr>
<tr>
<td>The municipality of Arvika</td>
<td>Active work</td>
<td>2004</td>
</tr>
<tr>
<td>The municipality of Filipstad</td>
<td>Active work</td>
<td>2005</td>
</tr>
<tr>
<td>The municipality of Grums</td>
<td>Active work</td>
<td>2005</td>
</tr>
<tr>
<td>The municipality of Hammarö</td>
<td>Non-active</td>
<td>—</td>
</tr>
<tr>
<td>The city of Karlstad</td>
<td>Very active work</td>
<td>2005</td>
</tr>
<tr>
<td>The municipality of Kil</td>
<td>Active work</td>
<td>2005</td>
</tr>
<tr>
<td>The municipality of Kristinehamn</td>
<td>Active work</td>
<td>2004</td>
</tr>
<tr>
<td>The county of Västernorrland</td>
<td>Very active with many different projects, courses, theme days etc. directed to municipalities.</td>
<td></td>
</tr>
<tr>
<td>The municipality of Härnösand</td>
<td>Active work</td>
<td>2004</td>
</tr>
<tr>
<td>The municipality of Kramfors</td>
<td>Very active work</td>
<td>2004</td>
</tr>
<tr>
<td>The municipality of Sollefteå</td>
<td>Very active work</td>
<td>2004</td>
</tr>
<tr>
<td>The city of Sundsvall</td>
<td>Active work</td>
<td>2004</td>
</tr>
<tr>
<td>The municipality of Timrå</td>
<td>Active work</td>
<td>2004</td>
</tr>
<tr>
<td>The municipality of Örnsköldsvik</td>
<td>Very active work</td>
<td>2005</td>
</tr>
</tbody>
</table>
adolescents’ access to tobacco—and by extension also perhaps their demand for tobacco—may be prohibitions on smoking in the home. Hill et al. consider that parents can be important influential factors for adolescents’ social sources of tobacco if they themselves attempt to stop or cut down smoking. It is also important that parents lay down clear rules for their children regarding smoking.

To limit adolescents’ demand for tobacco, efforts should also be made to influence adolescents’ attitudes to tobacco. A review article presents the effects different tobacco control policies may have on smoking rates, for instance the effects of mass-medial campaigns. The importance of role models such as teachers, doctors, movie stars, and fashion models being non-smokers are stressed by Sasco and Kleihues. Initiatives with another primary purpose than affecting adolescents’ access to tobacco may have a positive side-effect on adolescents’ smoking habits. One of the most recent amendments to the Swedish Tobacco Act was a prohibition on smoking in restaurants and cafes, introduced on 1 June 2005. The primary purpose of the ban on smoking was not to affect the number of individuals who smoke but to prevent exposure to passive smoking.

The differences reported between regions and over time regarding test purchasers’ opportunities for purchasing tobacco, should be interpreted with caution. Individual test purchasers may have affected the result through their behaviour when test purchasing. To make an entirely fair comparison between the regions and over time the optimum would be that the same group of adolescents conducted the test purchases in all regions. It is, however, not possible for economic and practical reasons to make use of the same group of adolescents for test purchases in all three regions. Also, using the same test purchasers all years of investigations is, for natural reasons, impossible. In order to improve the comparability of test purchases across regions and time the estimated age of the test purchasers have been accounted for in the data analysis. In addition, the study included only test purchases from municipalities where test purchases were conducted at all years of investigation.

Since the primary purpose with the minimum-age law was to reduce tobacco use among adolescents, an ultimate evaluation of the age-law must, of course, take changes in tobacco use into account. That issue will be addressed in a forthcoming paper.

Acknowledgements

Our profound gratitude is extended to the National Institute of Public Health in Sweden which provided the financial support that made this study possible.

References


Received 16 March 2006, accepted 22 June 2006

Key points

- This study sought to describe changes in adolescents’ opportunities for purchasing tobacco during the period 1996–2005 in Sweden.
- The Swedish minimum-age law has limited adolescents’ opportunities to purchase tobacco.
- In order to further improve the compliance with the minimum-age law, the need for efficient age-controls should be focused.
- The results indicate that local activities for improving the compliance make a difference to the adolescents’ opportunities for purchasing tobacco.

Downloaded from eurpub.oxfordjournals.org at FDA Medical Library on September 28, 2011