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Reactions of Adult and Teenaged Smokers to the Massachusetts Tobacco Tax

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ABSTRACT

Objectives. This study assessed smokers' reactions to a 25¢ cigarette tax imposed in Massachusetts.

Methods. A statewide telephone survey of 1783 adult smokers and 216 teenaged smokers was conducted.

Results. Among adult smokers, 3.5% reported that they had stopped smoking, owing in part to the price increase; 35% had considered quitting and 19% had attempted to cut the cost of smoking by switching to cheaper brands or cutting down. Among teenagers, 21% had considered quitting and 26% had cut costs. Low-income smokers were more responsive to the price increase than more affluent smokers.

Conclusions. A modest and temporary price increase promoted quitting among adult smokers and reduced cigarette consumption among low-income teenagers. (*Am J Public Health.* 1998;88:1389–1391)

The Commonwealth of Massachusetts imposed an excise tax of 25 cents per pack on cigarettes on January 1, 1993, resulting in a 15% increase in the average price per pack. Four months later, cigarette manufacturers reduced the price of premium brands. Despite the fact that most smokers experienced an increase in the cost of smoking for less than 6 months, data on cigarette consumption in Massachusetts show a 12.5% drop in sales from 1992 to 1993, compared with a 3% drop in the nation as a whole.[1]

Studies of the relationship between cigarette taxes and consumption of cigarettes have shown that the higher the tax increase, the greater the reduction in sales.[2–7] To date, no published analysis has examined smokers' perceptions of the impact of new tobacco taxes. This study does so by examining adults' and teenagers' reports about whether the price increase affected them and, if so, whether it led them to quit, to consider quitting, or only to reduce the cost of continuing to smoke. We hypothesized that lower-income smokers would be more responsive to the price increase than more affluent smokers and that in comparison with lighter smokers, heavier smokers would be more likely to try to reduce the cost of continuing to smoke rather than attempting to quit.

Methods

On the basis of household enumeration, a representative sample of Massachusetts adults and teenagers (12 to 17 years of age) was drawn by random-digit-dialing techniques.[8] Telephone interviews were conducted between October 1993 and March 1994, prior to the full implementation of a statewide tobacco control program.

Current adult smokers were defined as adults who reported having smoked at least 100 cigarettes in their lifetime and who said they now smoked "every day" or "some days." Posttax quitters were defined as adults who had smoked at least 100 cigarettes in their lifetime, who now smoked "not at all," and who reported stopping smoking regularly after January 1, 1993. Teenaged smokers were defined as teenagers who reported smoking more than 1 whole cigarette in their lifetime and at least 1 cigarette in the previous 30 days.

Smokers were asked whether or not they did each of the following when the price of cigarettes went up: bought fewer cigarettes; switched to a cheaper brand; and thought seriously about quitting. To clarify the motives underlying these actions, respondents were assigned to 1 of 3 mutually exclusive categories based on the pattern of their responses to these questions: (1) did not respond to tax (those who denied engaging in any of the 3 reactions); (2) cut costs (those who reported changing to a cheaper brand and/or reducing the number smoked but who did not consider quitting); and (3) considered quitting (those who reported considering quitting, with or without the other 2 reactions). Posttax quitters were asked whether the price increase had affected their decision to quit "a lot, some, a little, or not at all."

Data were weighted to account for oversampling. The SUDAAN program[9] was used to compute standard errors. Hypotheses were tested with multinomial logistic regressions. This program calculates coefficients for all possible pairs of outcomes in a multinomial set. In this case, the outcomes examined were

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cutting the cost of smoking, as opposed to doing nothing; considering quitting, as opposed to doing nothing; and cutting costs, as opposed to considering quitting.

Results

Response Rate

Screening interviews were completed in 78% of the sampled households. The response rates for selected adults and youths were 78% and 75%, respectively, resulting in 4733 adult interviews and 1606 youth interviews. The analyses of responses to the price increase were limited to the 216 current teenaged smokers who reported having ever bought cigarettes, 1657 current adult smokers, and 126 adult posttax quitters.

Reaction to the Price Increase

Forty-six percent of the adults and 53% of the teenagers who continued to smoke denied having had any of the 3 potential reactions to the price increase (Table 1). The most commonly reported reaction by adults was to consider quitting (35%), followed by changing to a cheaper brand (28%) and then by reducing the number of cigarettes smoked per day (17%). Among teenaged smokers, the most commonly reported reaction was to buy fewer cigarettes (29%), followed by thinking about quitting (21%) and then by changing to a cheaper brand (19%). When the mutually exclusive response patterns were considered, adults were substantially more likely to have considered quitting than to have cut costs only. Teenagers who responded to the price increase were more evenly split between these 2 patterns. Teenagers were significantly less likely than adults to consider quitting ($\chi^2_1 = 4.08, P < .05$).

The results of the multinomial logistic regressions are presented in Table 2. The bivariate odds ratios provide estimates of the impact of each predictor without controlling for all of the others. The results demonstrate that for both adult and teenaged smokers, age and sex were unrelated to reported response to the price increase. Household income was important for both groups. Among adult smokers, those with lower incomes were 3 times as likely as those with higher incomes to report cutting the cost of smoking and twice as likely to consider quitting, as opposed to having no response to the price increase. Household income was not related to adults' choice between cutting costs and considering quitting. Among younger smokers, those from low-income households were much more likely than their more affluent counterparts to cut the costs of their smoking in response to the price increase, rather than do nothing or consider quitting. For teenagers, household income was unrelated to the choice between considering quitting and doing nothing.

TABLE 1—Reported Reactions to 1993 Cigarette Tax Increase Among Current Massachusetts Smokers

	Adults (n = 1657)		Teenagers (n = 216)	
	%	(95% CI)	%	(95% CI)
Individual response[a]				
Changed to cheaper brand	28.4	(23.4, 33.4)	19.0	(4.0, 34.0)
Reduced number smoked	17.0	(13.3, 20.7)	28.7	(15.2, 42.2)
Considered quitting	34.6	(29.6, 39.6)	20.6	(13.4, 31.8)
Response pattern				
Cut costs	19.0	(15.1, 23.7)	26.0	(10.4, 42.0)
Considered quitting	35.0	(29.6, 39.6)	21.0	(9.3, 31.9)
No response	46.0	(40.9, 51.1)	53.0	(36.8, 69.6)

Note. CI = confidence interval.
[a]Responses to individual items were not mutually exclusive.

Being a relatively heavy smoker was a significant predictor of the reactions of adults but not teenagers. Among adult smokers, heavy smokers were twice as likely as lighter smokers to report cutting costs rather than not responding to the price increase. Adult heavy smokers were almost twice as likely to cut costs as to consider quitting, but this coefficient did not reach traditional levels of significance ($P = .06$).

To assess the independent impact of each predictor, we performed multivariate analyses by simultaneously entering all 4 predictors into the multinomial logistic regression. As shown in Table 2, all of the significant bivariate effects discussed above also emerged as significant in the multivariate models.

Perceived Impact of the Tax on Quitting by Adults

Eight percent of the adults who had been smokers before the tax increase reported having quit after the price went up. On a 4-point rating scale, 56% of the quitters said that the price increase had no effect at all on their decision to quit and 44% (3.5% of all adults who were smoking at the time) said it had at least some effect. A multiple regression analysis examining predictors of the reported effect of the price increase showed that age, sex, income, and level of smoking prior to quitting accounted for 28% of the variance (Satherwaite adjusted $F = 39.9$; $P < .001$). The only individual predictor that reached significance was income: the lower the household income, the greater the impact of the price increase on the respondent's decision to quit (Satherwaite adjusted $F = 10.1$; $P < .01$).

Discussion

This study demonstrated that a modest tax in Massachusetts that temporarily increased the price of cigarettes had a significant impact on adult smoking behavior. Of the adults who were smoking prior to implementation of the tax, 3.5% indicated that they had stopped smoking, owing in some degree to the price increase. This is an impressive finding, particularly in light of the fact that shortly after the tax increase, tobacco companies lowered the price of major brands and more low-cost generic cigarettes appeared on the market. More than one third of the adult smokers who did not quit reported that the price increase triggered thoughts of quitting smoking, and presumably some proportion of these individuals will go on to achieve abstinence in the future. The results of bivariate and multivariate analyses support the hypothesis that lower-income smokers are significantly more likely than higher-income smokers to respond to an increase in cigarette prices. The response patterns differ, however, for adults and teenagers. Low-income adults were more likely to either cut costs or consider quitting rather than not react to a price increase. Low-income teenagers were more likely than more affluent teens to cut costs by cutting down on smoking or (less often) by switching to cheaper brands. However, young low-income smokers were not more likely than wealthier teenagers to consider quitting.

The hypothesis that heavier smokers would be more likely to cut costs than to quit smoking received only marginal statistical support from the adult data. Since teenagers tend to be irregular smokers with a relatively

TABLE 2—Odds Ratios (ORs) for Predicting Responses to a 1993 Cigarette Price Increase in Massachusetts

	Adult Smokers, OR (95% CI)			Teenaged Smokers, OR (95% CI)		
	Cut Cost vs No Response	Consider Quitting vs No Response	Cut Cost vs Consider Quitting	Cut Cost vs No Response	Consider Quitting vs No Response	Cut Cost vs Consider Quitting
Bivariate model						
Age[a]	1.01 (0.99, 1.03)	1.01 (0.99, 1.03)	1.00 (0.98, 1.02)	1.02 (0.53, 1.98)	1.19 (0.66, 2.15)	0.86 (0.43, 1.73)
Male sex	0.84 (0.48, 1.46)	0.81 (0.52, 1.27)	1.03 (0.57, 1.87)	0.31 (0.06, 1.46)	1.67 (0.39, 7.23)	0.18 (0.03, 1.06)
Low income[b]	3.29* (1.78, 6.05)	2.18* (1.30, 3.63)	1.51 (0.78, 2.94)	7.57* (1.55, 36.98)	0.51 (0.13, 2.05)	14.72* (2.55, 84.95)
Heavy smoking[c]	2.11* (1.16, 3.85)	1.13 (0.68, 1.88)	1.86 (0.97, 3.59)	2.39 (0.47, 12.24)	0.60 (0.13, 2.77)	3.99 (0.61, 26.23)
Multivariate model						
Age	1.01 (0.99, 1.03)	1.00 (0.98, 1.03)	1.00 (0.98, 1.02)	1.11 (0.61, 2.02)	1.15 (2.66, 2.01)	0.96 (0.49, 1.91)
Male sex	0.99 (0.54, 1.81)	0.81 (0.48, 1.35)	1.23 (0.63, 2.38)	0.26 (0.04, 1.51)	1.65 (0.37, 7.35)	0.16 (0.02, 1.29)
Low income	3.38* (1.79, 6.36)	1.98* (1.17, 3.34)	1.71 (0.85, 3.42)	7.64* (1.37, 42.56)	0.58 (0.13, 2.49)	13.26* (1.93, 91.57)
Heavy smoking	2.08* (1.10, 3.93)	1.03 (0.60, 1.78)	2.01 (0.98, 4.12)	2.15 (0.43, 10.65)	0.70 (0.14, 3.51)	3.05 (0.45, 20.95)

Note. CI = confidence interval.
[a]Age in years (continuous variable).
[b]Household income is dichotomized at the median—for adults, $30 000/y; for teenagers, $50 000/y. Household income for teenagers was obtained from the report of an adult household resident during the screening interview.
[c]Smoking was dichotomized at 20 cigarettes per day for adults, 20 cigarettes per week for teenagers.
*$P < .05$.

low daily intake, they may not see the cost of smoking as a significant factor. Previous research indicates that among teenagers, price is more likely to affect the decision to start smoking than to affect the behavior of those who have already begun.[6,7] Our results are consistent with this expectation, but they must be interpreted with caution, given the small sample of teenaged smokers.

In conclusion, these results suggest that taxes on cigarettes, even if they are countered by tobacco industry price wars, serve to promote smoking reduction among both adults and teenagers, especially those from low-income households. Even a temporary price increase apparently reinforces latent intentions to quit among adults. A tax provides economic incentives to quit and may also send a potent message of societal disapproval that may affect smokers' behavior. Indeed, coupled with appropriate cessation, prevention, and educational initiatives, a cigarette excise tax may become, for many smokers, the last straw on the camel's back. □

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