

# Smoking Beliefs and Behavior Among Youth in Malaysia and Thailand

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**Objective:** To characterize smoking beliefs among Thai and Malaysian youth and to examine associations with gender, antismoking media exposure, and smoking status. **Methods:** Nationally representative samples of youth completed self-administered questionnaires. **Results:** A substantial proportion of youth reported positive beliefs about smoking. Those reporting positive beliefs were more likely to be susceptible to smoking. Youth

who noticed antismoking media were less likely to report positive beliefs about smoking. **Conclusions:** As in Western countries, beliefs about smoking held by youth in Southeast Asia are associated with smoking status. Antismoking media may be an important means of targeting beliefs about smoking among youth.

**Key words:** smoking, beliefs, youth, Thailand, Malaysia

*Am J Health Behav.* 2009;33(4):366-375

Tobacco use is the leading cause of preventable death in the world, resulting in approximately 5 million deaths per year.<sup>1</sup> The health burden from smoking is not only increasing, but it is also shifting to low-income and middle-income countries: whereas the prevalence of smoking continues to decline in many Western markets, many Asian markets continue to grow.<sup>2</sup> At present, approximately 500 million of the world's

1.3 billion smokers live in Asia.<sup>3</sup>

Tobacco use among Asian countries is characterized by significant gender differences. Although males are only marginally more likely than females to smoke in many Western countries, smoking rates among Asian males typically approach or exceed 50% whereas fewer than 5% of Asian women smoke.<sup>2,3</sup> Traditional gender roles and limited access to material resources have restricted tobacco

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use among Asian women to date. However, as rapid socioeconomic change takes place in Asia—including the movement of women into the paid workforce—social traditions and women's economic status are shifting.<sup>4</sup> In addition, the presence of multinational tobacco companies in Asia is increasing, and Asian women are now the target of well-funded marketing campaigns that link smoking with Western ideals of thinness and glamour.<sup>5</sup> Therefore, there is growing concern that tobacco use among Asian women will follow the trajectories observed in Western societies over the past 50 years and increase to levels similar to those of males.<sup>5</sup>

Increases in smoking among Asian women are likely to appear first among the youth population. Smoking initiation in both Western and Asian countries typically occurs during youth and young adulthood, and early initiation is associated with a greater dependence and higher mortality from smoking-related diseases.<sup>6,7</sup>

Beliefs about smoking are important predictors of smoking behavior among youth.<sup>8</sup> The belief that parents disapprove of smoking has been shown to be a powerful predictor of behavior—even more so than parental behavior.<sup>9,10</sup> Other beliefs associated with youth smoking behavior include social norms regarding the perceived number of peers or adults who smoke and the belief that smoking is acceptable for teens.<sup>11-13</sup> Youth who hold beliefs about the aesthetic benefits of smoking are also at an increased risk of smoking uptake; such beliefs include the idea that smoking makes people look more cool, sexy, or mature.<sup>11,12,14</sup>

Tobacco marketing has an important influence on beliefs about smoking. Exposure to pro-tobacco advertising has been found to be associated with positive attitudes toward smoking and smoking behavior,<sup>15,16</sup> whereas antitobacco media campaigns have been found to reduce or prevent smoking among youth.<sup>17,18</sup>

To date, relatively little research on the predictors of smoking uptake among youth has been conducted in Asia, particularly regarding psychosocial beliefs. The present study examined beliefs about smoking among youth in 2 Southeast Asian countries: Thailand and Malaysia. For more than a decade, Thailand has served as a model for tobacco control in Asia. Thailand was among the first coun-

tries in the world to introduce comprehensive restrictions on advertising and promotion, and it has since introduced a range of comprehensive tobacco control measures.<sup>19,20</sup> Thailand is also one of the few Asian countries to experience a decline in smoking rates over the past decade.<sup>21</sup> At present, slightly less than one fifth of those 15 years or older are daily smokers, although this rate obscures substantial differences between genders: 37% of Thai men are daily smokers whereas only 2% of Thai women smoke.<sup>21</sup> Tobacco use in Thailand among youth aged 15-18 is approximately 5%.<sup>22</sup>

In Malaysia, the prevalence of tobacco use is approximately 24.8%: 49.2% of men smoke, compared with only 3.5% of women.<sup>23</sup> Although there are no precise national estimates of youth smoking in Malaysia, findings from several surveys suggest youth smoking may be on the rise. Results of the 2 National Health and Morbidity Surveys conducted in 1996 and 1999 suggest that the proportion of young females who smoke rose from 4.8% to 8% whereas the 2003 Global Youth Tobacco Survey of 13- to 15-year-olds reported that 39.2% of males and 11.2% of females currently used some form of tobacco.<sup>23,24</sup> Until recently, Malaysia had few comprehensive tobacco control policies. However, in 2004/2005, the Malaysian government conducted a comprehensive national antitobacco media campaign called "Tak Nak" ("Say No"), specifically targeting youth.

The current study examined beliefs toward smoking among nationally representative samples of youth in Thailand and Malaysia and their association with antismoking media and smoking behavior. The objectives of the study were (1) to characterize the beliefs of Thai and Malaysian youth, (2) to explore gender and country differences, and (3) to determine how those beliefs are associated with antismoking media and behavior.

## METHODS

Respondents in the International Tobacco Control Southeast Asia (ITC-SEA) Survey were 2002 youth between the ages of 13 and 17 from Thailand (n=1000) and Malaysia (n=1002). The ITC-SEA Survey used face-to-face recruitment of participants from an area sample of households. The sample of households was selected using a stratified multistage sam-

pling design. The primary strata consisted of Bangkok and 4 regions (north, northeast, central, and south) in Thailand and the 6 zones of Malaysia. In Thailand, respondents were selected from Bangkok and 2 provinces in each of Thailand's 4 regions (Chiang Mai, Phrae, Nakhon Ratchasima, Nong Khai, Nakhon Pathom, Samut Sakhon, Nakhon Si Thammarat, and Songkhla). In Malaysia, respondents were drawn from one state in each of the country's 6 zones: Kedah, Selangor, Johor, Terengganu, Sabah, and Sarawak.

In both countries, within each province or state, there was a secondary stratification into urban and rural districts. Ultimate sample allocations within the secondary strata were made proportional to their sizes. Households were selected within each cluster using systematic sampling methods in Malaysia and enumeration followed by simple random sampling in Thailand. Sampling within a cluster proceeded until the respondent quota in each sampling category was filled. Once a potentially eligible household was identified and contacted, interviewers enumerated all household members. In households with more than one eligible respondent per quota cell, respondents were randomly selected by using a variant of the Kish grid.<sup>25</sup>

Youth respondents completed a 30-minute self-administered (ie, paper and pencil) questionnaire. In Malaysia, surveys were available in either English or Malay; in Thailand, all respondents completed surveys in Thai. Respondents were instructed to complete the survey in a "private area" to ensure privacy from family members and to seal the survey in an envelope in order to maintain confidentiality and to encourage truthful reporting. Parental permission and youth consent were ascertained prior to surveying. Youth respondents were provided with a T-shirt in appreciation for their time.

All surveys were conducted between January and March 2005. In Malaysia, the study was administered by experienced interviewers from the Ministry of Health and from the National Poison Centre (Universiti Sains Malaysia); fieldwork in Thailand was completed by experienced interviewers from the Institute for Population and Social Research (Mahidol University). All survey questions and study procedures were standardized as far as

possible across the 2 countries. Additional information on the research design and survey methodology is available.<sup>26</sup> All procedures were cleared for ethics by institutional review boards or research ethics boards at the Universiti Sains Malaysia, Mahidol University, University of Waterloo, The Cancer Council Victoria, and Roswell Park Cancer Institute.

### Measures

**Demographic variables.** Respondents reported their age and gender. Urban or rural status was obtained from the household enumeration, completed by an adult informant.

**Smoking behavior.** Smoking status was assessed by asking, "Have you ever smoked a cigarette, even just a few puffs?" and "How many cigarettes have you smoked in your life?" Respondents who had smoked at least one cigarette were asked, "Think about the last 30 days. How often did you smoke?" The following criteria were used to define smoking status<sup>27</sup>: never smokers (never smoked a cigarette), current smokers (smoked more than 100 cigarettes in their lifetime and smoked at least one day in the past 30 days), puffers (had tried a cigarette, but had not smoked a whole cigarette), experimenters (smoked between one and 100 cigarettes), and former smokers (smoked more than 100 cigarettes in their lifetime, but had not smoked in the past 30 days).

**Susceptibility to smoking.** The survey included 2 measures of susceptibility: "If one of your best friends were to offer you a cigarette, would you smoke it?" and "At any time during the next year do you think you will smoke a cigarette?"<sup>28</sup> Youth could respond, "Definitely not," "Probably not," "Probably yes," or "Definitely yes." Youth were considered susceptible if they gave any response other than "definitely not."

**Aesthetic beliefs.** Aesthetic beliefs about smoking were assessed by 6 different statements and questions: "Smoking is a sign of being modern." "Smoking makes young people look more mature." "Smoking helps to control body weight." "Smoking is disgusting." "Do you think smoking cigarettes makes young men look more or less attractive?" "Do you think smoking cigarettes makes young women look more or less attractive?" For

the first 4 statements, participants could respond using “agree,” “disagree,” or “in between.” The last 2 questions were answered using “less attractive,” “more attractive,” or “no difference” from non-smokers.

**Social acceptability.** The social acceptability of smoking was assessed by 5 different statements and questions. The first 4 statements were answered using “agree,” “disagree,” or “in between” responses: “Thai/Malaysian society disapproves of smoking.” “It is acceptable for young men (aged 15 to 25) to smoke.” “It is acceptable for young women (aged 15 to 25) to smoke.” “Most of the popular people my age smoke.” Youth were also asked the question “Would your parents or guardian consider it acceptable or unacceptable for you to smoke?” to which they could respond, “Unacceptable,” “Acceptable,” or “My parents / guardian don’t have an opinion.”

**Noticing antismoking media.** Youth were asked if they had noticed advertising or information that talks about the dangers of smoking or encourages quitting in any of the following places during the past 6 months: television, radio, posters, billboards, newspapers or magazines, movie cinema, discos or karaoke lounges, and cigarette packs.

### Statistical Analysis

All data were analyzed using SPSS software (Version 15.0). Point estimates (eg, frequencies and means) were computed from weighted data. Chi-square tests were used to examine bivariate associations for categorical measures, and t-tests were used to compare means from continuous measures.

Smoking related beliefs measured on a 3-point scale (ie, agree, not sure, disagree) were categorized as agree/not sure vs disagree. Indices of positive social acceptability and aesthetic beliefs about smoking were created. For each positively worded statement (eg, “Smoking is a sign of being modern”), agree/not sure responses were scored as 1 and disagree responses were scored as 0. For each negatively worded statement (eg, “Smoking is disgusting”), disagree/not sure responses were scored as 1 and agree responses were scored as 0. Scores for each individual measure were summed to give an overall score. An index for noticing antismoking media was also created.

**Table 1**  
**Sample Characteristics by**  
**Country (n=2002)**

	Thailand	Malaysia
<b>Sample Size</b>	1000	1002
<b>Mean Age (SE)</b>	14.7 (0.04)	15.2 (0.08)
<b>Gender</b>		
Female	48.9%	49.3%
Male	51.1%	50.7%
<b>Urban vs Rural Status</b>		
Urban	26.0%	58.9%
Rural	74.0%	41.1%
<b>Smoking Status</b>		
Never	84.3%	86.3%
Ever	15.7%	13.7%
Former	0.1%	0.1%
Puffer	0.3%	0.7%
Experimenter	12.1%	10.5%
Current	3.2%	2.4%
<b>Susceptibility to Smoking</b>		
Would smoke a cigarette if offered by one of best friends.	17.3%	18.0%
Would smoke a cigarette sometime during next year.	19.2%	19.3%
Susceptibility overall	24.2%	23.4%

**Note.**  
**All data are weighted.**

Youth were given a score of 1 for each media source they reported noticing. Scores for each individual media measure were summed to give an overall score.

A linear regression was conducted to examine the association between noticing antismoking media and beliefs about smoking. A logistic regression was also conducted to examine the association between smoking beliefs and susceptibility to smoking (where 0 = definitely not to both susceptibility questions and 1 = all

**Table 2**  
**Beliefs About Smoking Among Thai and Malaysian Youth by Gender (n=1996)**

Full or Partial Agreement	Thailand			Malaysia		
	Female	Male	Overall	Female	Male	Overall
<b>Aesthetic Beliefs About Smoking</b>						
Smoking makes young women look more attractive. (+)	37.4%	50.6%**	44.2%	20.1%	21.6%	20.9%††
Smoking makes young men look more attractive. (+)	40.7%	58.0%**	49.6%	34.2%	38.4%	36.3%††
Smoking makes young people look more mature. (+)	65.3%	61.7%	63.4%	36.7%	40.0%	38.4%††
Smoking is a sign of being modern. (+)	18.9%	27.2%	23.1%	25.1%	29.9%	27.5%
Smoking helps to control body weight. (+)	35.9%	41.2%	38.6%	48.6%	50.1%	49.4%††
Smoking is disgusting. (-)	87.9%	82.0%	84.9%	87.0%	86.3%	86.7%
<b>Positive Aesthetic Beliefs Index (Score out of 6)</b>	2.4	2.9**	2.6	2.0	2.3	2.1††
<b>Social Acceptability Beliefs About Smoking</b>						
Parents/Guardian believe that smoking is acceptable. (+)	23.3%	36.6%**	30.1%	25.9%	23.7%	24.8%†
Smoking is acceptable for young women (age 15-25). (+)	29.4%	30.3%	29.8%	15.0%	27.6%**	21.4%††
Smoking is acceptable for young men (age 15-25). (+)	43.9%	48.6%	46.3%	28.1%	41.1%**	34.7%††
Most of the popular people my age smoke. (+)	43.0%	51.4%*	47.3%	54.1%	61.9%	58.1%††
Society disapproves of smoking. (-)	86.0%	80.7%*	83.2%	85.1%	77.8%*	81.4%
<b>Positive Social Acceptability Beliefs Index (Score out of 5)</b>	2.0	2.3**	2.1	1.8	2.2**	1.9

**Note.**

All data are weighted. The symbols (+) and (-) refer to whether the statement is a positive (+) or negative (-) belief about smoking.

\* Gender Differences Within Country: \* P ≤ 0.05, \*\* P ≤ 0.01

† Overall Country Differences: † P ≤ 0.05, †† = P ≤ 0.01

other responses). A second logistic regression was conducted to examine the association between beliefs about smoking and smoking status (where 1 = experimental or current smoker, and 0 = all others). All analyses were conducted using weighted data using the “Complex Samples” feature in SPSS to take the survey design into account.

**RESULTS**

**Demographics and Smoking Status**

Table 1 presents sample characteristics and smoking status for youth respondents in Thailand and Malaysia. As reported previously,<sup>29</sup> there were no significant differences in smoking status between the 2 countries. Overall, males were significantly more likely than females to have ever tried smoking: approximately 25% of males were either experimental or current smokers compared to approximately 4% of females (data not shown).

**Aesthetic Beliefs About Smoking**

Table 2 presents aesthetic beliefs about

smoking. Males were more likely than females to believe that smoking makes young men and young women look more attractive and that smoking is a sign of being modern. Within Thailand, males were more likely than females to believe that smoking makes young men and young women look more attractive. Within Malaysia, there were no significant gender differences. Overall, based on the positive aesthetic beliefs index, males held significantly more positive beliefs about the aesthetics of smoking compared to females.

Significant between-country differences were observed between Thai and Malaysian youth. Thai youth were more likely to report that smoking makes young men and young women look more attractive and that smoking makes young people look more mature. Malaysian youth were more likely to believe that smoking helps to control body weight. Overall, based on the positive aesthetic beliefs index, Thai youth held more positive aesthetic beliefs towards smoking than did Malaysian youth.

**Table 3**  
**Noticing Antismoking Media Among Thai and Malaysian Youth by Gender (n=2002)**

% Who Reported Noticing Media	Thailand			Malaysia		
	Female	Male	Overall	Female	Male	Overall
<b>Media Source</b>						
Television	81.6%	79.6%	80.6%	90.4%	88.0%	89.2%††
Cigarette packs	65.4%	65.1%	65.2%	43.3%	56.0%*	49.8%††
Posters	63.8%	57.8%	60.7%	79.8%	80.7%	80.3%††
Newspapers or magazines	49.8%	53.5%	51.7%	64.9%	68.7%	66.9%††
Radio	45.3%	47.4%	46.4%	55.4%	55.8%	55.6%††
Billboards	46.2%	43.0%	44.6%	76.8%	78.4%	77.6%††
Movie Cinema	35.5%	38.2%	36.9%	21.6%	24.9%	23.3%††
Discos, karaoke lounges, etc	18.6%	24.4%*	21.5%	10.0%	15.6%	12.9%††
<b>Noticing Antismoking Media Index (Score out of 8)</b>	<i>4.1</i>	<i>4.1</i>	<i>4.1</i>	<i>4.4</i>	<i>4.7</i>	<i>4.6††</i>

**Note.**

All data are weighted.

\* Gender Differences Within Country: \*  $P \leq 0.05$ , \*\*  $P \leq 0.01$

† Overall Country Differences: †  $P \leq 0.05$ , †† =  $P \leq 0.01$

**Social Acceptability Beliefs About Smoking**

Table 2 presents youth beliefs about the social acceptability of smoking. Within Thailand, males were more likely than females to believe that parents/guardians find smoking acceptable and that most of the popular people their age smoke. Within Malaysia, males were more likely than females to believe that smoking is acceptable for young men and young women. Within both countries, females were more likely than males to believe that society disapproves of smoking. Overall, based on the positive social acceptability beliefs index and for each of the 5 individual items, males were more likely than females to hold positive beliefs about the social acceptability of smoking.

Significant differences in social acceptability beliefs existed between countries. Thai youth were more likely to report that smoking is acceptable for young men and young women and that parents/guardians believe that smoking is acceptable. Malaysian youth were more likely to believe that most of the popular people their age smoke. Based on the positive social acceptability beliefs index, however, no significant country difference existed for social acceptability be-

liefs towards smoking.

**Noticing Antismoking Media**

Self-reported exposure to antismoking media was examined to explore the association with beliefs about smoking. Table 3 presents youth reports of noticing antismoking media over the past 6 months. Overall, females and males were equally likely to report exposure to antismoking media except for 2 items: males were more likely to notice antismoking advertisements in discos and on cigarette packs. Significant differences existed between countries in noticing antismoking media. Malaysian youth were more likely to notice antismoking advertisements through television, radio, posters, billboards, and newspapers. Thai youth were more likely to notice antismoking advertisements at the cinema, at the disco, and on cigarette packs. Overall, based on the noticing antismoking media index, Malaysian youth were more likely than Thai youth to notice antismoking media.

**Noticing Antismoking Media, Beliefs About Smoking, and Smoking Status**

A linear regression model was conducted to examine whether noticing anti-

**Table 4**  
**Linear Regression Analyses Predicting Positive Aesthetic Beliefs About Smoking and Positive Social Acceptability Beliefs About Smoking (n=1974)**

	Estimate	(SE)	t	P
<b>Positive Aesthetic Beliefs</b>				
Noticing Antitobacco Media	-0.70	(0.22)	-3.14	0.003
Age	0.08	(0.03)	2.77	0.008
Gender: Male (Reference = Female)	0.38	(0.09)	-4.20	<0.001
Community Type: Urban (Reference = Rural)	0.03	(0.11)	0.29	0.774
Country: Thailand (Reference = Malaysia)	0.53	(0.08)	6.98	<0.001
	<i>R<sup>2</sup> = 0.05</i>			
<b>Positive Social Acceptability Beliefs</b>				
Noticing Antitobacco Media	-0.48	(0.16)	-3.01	0.004
Age	0.10	(0.03)	3.69	0.001
Gender: Male (Reference = Female)	0.33	(0.07)	4.70	<0.001
Community Type: Urban (Reference = Rural)	0.12	(0.09)	1.41	0.166
Country: Thailand (Reference = Malaysia)	0.21	(0.08)	-2.47	0.017
	<i>R<sup>2</sup> = 0.33</i>			

**Note.**

All data are weighted. Higher levels mean more positive beliefs about smoking.

smoking media was associated with positive smoking beliefs. Age, gender, urban or rural status, and country were covariates in the analysis. An interaction effect between country and noticing media was analyzed but was not significant and was therefore removed from the analysis. Noticing antismoking media was significantly associated with lower positive aesthetic beliefs and lower positive social acceptability beliefs towards smoking.

A logistic regression model was conducted to examine whether beliefs about smoking were associated with susceptibility to smoking. Age, gender, urban or rural status, and country were used as covariates in the analysis. Youth who reported more positive aesthetic beliefs were significantly more likely to be susceptible to smoking (OR 1.48, P<0.001). Similarly, youth who reported more positive social acceptability beliefs towards smoking were significantly more likely to be susceptible to smoking (OR 1.24, P=0.001).

A subsequent logistic regression model was conducted to examine whether beliefs about smoking were specifically associated with experimental and current

smoking. Age, gender, urban or rural status, and country were used as covariates in the analysis. Youth holding positive aesthetic beliefs were significantly more likely to report current or experimental smoker (OR 1.42, P<0.001). There was no significant association between holding positive social acceptability beliefs and current or experimental smoking (OR 1.14, P=0.06).

**DISCUSSION**

This study is among the first to examine beliefs about the aesthetic properties and social acceptability of smoking among Asian youth. The findings indicate that Thai and Malaysian youth hold ambivalent beliefs towards smoking. Over 40% of youth reported that smoking makes young people look more mature, makes young men look more attractive, and helps to control body weight. However, when asked if they thought smoking is disgusting, over 85% either fully or partially agreed. These findings may be the result of mixed messages communicated by health authorities and the tobacco industry.

Males were significantly more likely to hold positive aesthetic beliefs towards smoking than were females. One notable

**Table 5**  
**Logistic Regression Predicting Likelihood of Being Susceptible to Smoking (n=1967)**

	OR	OR (95% CI)	P
Positive Aesthetic Beliefs	1.48	1.35 – 1.63	< 0.001
Positive Social Acceptability Beliefs	1.24	1.10 – 1.40	0.001
Age	1.22	1.10 – 1.35	< 0.001
Gender: Male (Reference = Female)	1.61	1.28 – 1.95	< 0.001
Community Type: Urban (Reference = Rural)	0.84	0.61 – 1.17	0.292
Country: Thailand (Reference = Malaysia)	0.83	0.63 – 1.11	0.208

Note.

All data are weighted.

finding, however, was that males and females were just as likely to believe that smoking helps control body weight. This finding contrasts with Western studies, which typically report that female youth worry more about their weight and are more likely to report smoking to control their weight than are males.<sup>30</sup>

Although smoking was viewed as less acceptable for young women (25%) than young men (40%), the perceived acceptability of smoking for young women was considerably higher than the actual prevalence of smoking for young women. Smoking among adult women in both countries is less than 5% and even lower for the age-group of our sample;<sup>21</sup> therefore, the high level of perceived acceptability of smoking for young women is not the result of seeing other females smoke, at least not in person. As reported elsewhere, the tobacco industry has invested heavily in advertising that targets Asian women with ideals of glamour, wealth, and liberation, all of which would lead to a greater perceived benefit to and acceptability of smoking.<sup>4</sup>

Positive aesthetic and social acceptability beliefs were independently associated with susceptibility to smoking. Positive aesthetic beliefs were also associated with experimental and current smoking. These findings suggest that aesthetic beliefs may be somewhat more important in this age-group than social acceptability beliefs. The association between beliefs and smoking behavior is likely a reciprocal one: youth with more positive beliefs about smoking may be more likely to experiment or initiate

smoking whereas those who are already smoking may have greater motivation than nonsmokers to perceive positive aspects of their behavior. This finding is consistent with previous research among youth from both Western and non-Western countries.<sup>8,11</sup>

There were significant differences between Thai and Malaysian youth. Although there were no significant differences in smoking status, Thai youth held significantly more positive aesthetic smoking beliefs and were less likely to recall noticing antismoking media, even after adjusting for age, gender, and urban or rural status. To date, Thailand has implemented and enforced policies on industry advertising, sponsorship, and promotion that are among the most restrictive in the world. However, in the months leading up to the survey, the Malaysian government conducted their first comprehensive national antitobacco media campaign targeting youth. This “Tak Nak” (“Say No”) campaign ran on television, radio, posters, billboards, and newspapers—media outlets for which Malaysian youth reported noticing information on the dangers of smoking significantly more often than did Thai youth. Noticing antismoking media was associated with less positive beliefs towards smoking. Greater exposure may help to explain why positive beliefs were lower among Malaysian youth than Thai youth.

#### Limitations

The prevalence estimates reported in this study are subject to the usual limitations concerning self-reported smoking

among youth.<sup>31,32</sup> Underreporting of smoking behavior is more common among younger adolescents and in situations where the social desirability is strongest, such as in a school setting. Underreporting may be particularly high in school surveys, given that smoking is a disciplinary offense for school students in Malaysia. We tried to minimize social desirability bias by having youth complete the survey in a private area of their home and by stressing the confidentiality of the findings. Furthermore, the high level of reported prosmoking attitudes suggests little reluctance to admit to prosmoking activity.

The prevalence estimates are also subject to the limitations of the sampling design. For reasons of administration and cost, the number of primary sampling units within strata was relatively small, and the sample of households within the primary sampling units was geographically clustered. Such a sample cannot be as representative of the national population as a simple random sample of the same number of households. There is also some indication of differential response rates: household response rates were lower in urban than in rural areas and lower among those of ethnic Chinese background in Malaysia. Data from the subsequent waves of the ITC-SEA Survey will help to examine the trajectory of smoking behavior as the cohort ages and reaches young adulthood.

Another limitation of the data is that it is cross-sectional in nature and therefore causal direction cannot be inferred between antismoking media and beliefs or beliefs and smoking status. The ITC-SEA Survey is a cohort survey, which will allow us to examine issues related to causal direction with greater confidence in subsequent survey waves. Furthermore, it is not possible to model all of the influences on positive beliefs. Other important factors were not included in the current analysis, such as exposure to pro-tobacco marketing, which has been shown to influence beliefs and attitudes about smoking. The significant cultural and social differences between Thailand and Malaysia may also be associated with youth beliefs about smoking and were not examined in the current paper.

## CONCLUSIONS

These findings highlight the impor-

tance of research into youth smoking in Asia. Trends in youth smoking can help to signal shifts in the tobacco epidemic in Asia, particularly with regard to changes in smoking prevalence among females. Understanding the beliefs, opinions, and attitudes of youth—and the relation of these psychosocial factors to smoking status and susceptibility to smoking—provides the starting point for developing effective tobacco control interventions in this critical region.

## Acknowledgments

The research was funded by grants from the US National Cancer Institute/NIH (from the Roswell Park Transdisciplinary Tobacco Use Research Center (TTURC), P50 CA111236, and from R01 CA100362), the Canadian Institutes for Health Research, the Malaysian Ministry of Health, and the Centre for Behavioural Research and Program Evaluation of the National Cancer Institute of Canada/Canadian Cancer Society. ■

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