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The Youth Tobacco Epidemic in Asia

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AYARR
Asian Young Adult Reproductive Risk Project

This research is a product of the East-West Center's Asian Young Adult Reproductive Risk (AYARR) project, supported by USAID through its MEASURE Evaluation Project. The AYARR project supports a research network devoted to producing an Asian regional perspective on young adult risk behaviors through secondary and cross-national comparative investigation of large-scale, household-based surveys of youth.

The project presently involves investigators and national surveys in six Asian countries. The government of **Hong Kong** (now the Hong Kong Special Administrative Region) has supported area-wide youth surveys, both household-based and in-school, in 1981, 1986, 1991, and 1996. The 1994 **Philippines**' Young Adult Fertility and Sexuality Survey (YAFS-II) was conducted by the Population Institute, University of the Philippines, with support from the UNFPA. **Thailand**'s 1994 Family and Youth Survey (FAYS) was carried out by the Institute for Population and Social Research at Mahidol University, with support from the UNFPA. In **Indonesia**, the 1998 Reproduksi Remaja Sejahtera (RRS) baseline survey was funded by the World Bank and by USAID through Pathfinder International's FOCUS on Young Adults program. The RRS was carried out by the Lembaga Demografi at the University of Indonesia under the supervision of the National Family Planning Coordinating Board (BKKBN). The **Nepal** Adolescent and Young Adult (NAYA) project, which includes the 2000 NAYA youth survey, is being carried out by Family Health International and the Valley Research Group (VaRG) with support from USAID to Family Health International (FHI). The **Taiwan** Young Person Survey (TYPF) of 1994 was carried out by the Taiwan Provincial Institute of Family Planning (now the Bureau for Health Promotion, Department of Health, Taiwan) with support from the government of Taiwan.

The Youth Tobacco Epidemic in Asia

By

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Abstract

This report examines smoking behavior among 15-19 year olds in five Asian countries: Indonesia, Nepal, the Philippines, Taiwan, and Thailand using national level youth surveys collected in recent years. Smoking prevalence among young men aged 15-19is high: 38% in Indonesia, 33% in Thailand, 30% in Taiwan, 28% in the Philippines, and 12% in Nepal. Smoking prevalence is very low among young women in all of the Asian countries under study, the highest being 5 percent in Taiwan. It is lowest among Indonesian women.

In countries where we have data, we found that a large proportion of teen smokers tried to quit or want to quit smoking sometime, but that most teens who have tried quitting did not succeed.

In Indonesia and Philippines, where we have information on parent's attitudes on smoking, parents are found to be very permissive about their sons' smoking but not about their daughters' smoking. Parents' attitudes, as perceived by their children, are closely related to smoking behavior among 15-19 year old youth in Indonesia and the Philippines. Parents are found to affect their children's smoking behavior in other ways as well: children who have close relationships with parents are less likely to be smokers. Indonesian young men are less likely to smoke if they had frequent conversations with fathers while they were growing up. Filipino women who were raised by two parents have lower probability of smoking than young women who were not raised by two parents, but this factor does not affect young men's smoking behavior. In Taiwan, having a lot of time with father lowers young men's smoking prevalence and talking to mother at times of trouble lowers smoking prevalence of both young men and women.

Urban residence has some affects smoking behavior among Filipino women. Young women aged 15-19 living in Manila are much more likely to smoke than young Filipino women living elsewhere. This finding indicates that modernization may increase women's smoking in the Philippines. Our analysis shows only weak associations between parent's education and the smoking behavior of young men and women. Only in Nepal, they are found to have statistically significant effects, but the effects on young men and on young women are opposite. For young men, the relationship is positive, and for young women, the relationship is negative.

Smoking is much more prevalent among youth who have experienced some transitions to adulthood such as leaving school, living away from parents, and having married.

It is imperative that health education program delivers strong messages about the health risks of smoking as well as the strong addictive nature of smoking. It is important to help youth realize that they cannot just begin smoking, enjoy it for a while, and then quit. Parents have potentially important roles in reducing youth tobacco epidemic. Having firm attitude against smoking, and having close relationships with their children are likely to reduce the probability of their children's smoking. Communities need to provide substitute roles of parents for youth who are not living with their parents.

Educational systems, families, media, and community leaders and organizations need to work together to change the images of adulthood. They should work together to provide alternative activities to smoking for youth who want to behave like adults.

Married youth aged 15-19 in Nepal and Indonesia are more likely to be smokers than single youth. In Nepal and Indonesia where early marriage and childbearing is common, young married women need to be informed about health risks associated with smoking during pregnancies such as giving low birth weights and high probability of perinatal complications.

Health professionals have identified tobacco use as the number one health problem in the 21st century. Smoking increases risks of heart disease, cancers of many sites, and respiratory diseases. Smoking during pregnancy increases babies' risk of low birth weight and other perinatal complications. For non-smokers, exposure to environmental tobacco smoke causes lung cancer and children's respiratory health problems. Economic consequences of smoking are serious as well. Premature deaths due to tobacco use result in loss of productive lives in population. And high level of morbidity caused by tobacco use incurs high costs of health care (Satcher 2001; WHO 1997, 1999).

By 2020, tobacco use is expected to cause more premature death and disability than any other single disease. Deaths due to tobacco use are expected to increase from 4 million in 1998 to 10 million in 2030. These expected increases in death are not distributed evenly across the regions. Developing regions will experience much larger share of the increases than the developed regions. The Asian region is expected to experience a fourfold increase while the developed regions will experience a 50% increase (Murray and Lopez 1996).

Smoking prevalence in Asia is likely to rise for several reasons. Continuing economic development will result in more individuals having disposable income for purchasing cigarettes. Smoking prevalence among women is low in most Asian countries, but is likely to rise rapidly in the future as gender differences in behavior narrow with modernization. In addition, multinational tobacco companies are marketing their products with increasing intensity in Asia, especially targeting young adults (Bettcher, Yach, and Guindon 2000; Pierce et al. 1991)

Smoking among youth is associated with additional health and social problems. Smoking affects physical growth and youth activities. The younger people start smoking, the more likely they are to become strongly addicted to nicotine. Furthermore, adolescents who smoke are much more likely to use alcohol, use drugs, engage in fighting, and engage in unprotected sex (CDC 1994; Willard and Shoenborn 1995).

Most smokers begin smoking during their transition to adulthood, typically before age 20. Yet, studies on smoking behavior among youth at the national level are rare for most Asian countries. This report examines smoking behavior among 15-19 year olds in five Asian countries: Indonesia, Nepal, the Philippines, Taiwan, and Thailand using

national level youth surveys collected in these countries in recent years. These youth surveys provide opportunities to examine the smoking behavior of youth in relation to community and family settings, and individual characteristics.

DATA

We use data from large-scale surveys of youth in the five countries mentioned above. These surveys were designed and carried out independently from each other, but have some common characteristics. All of them are either nationally representative or representative of a large the youth proportion of populations in each country. The samples consist of youth in their late teens and early 20s and covered both men and women of all marital statuses. All surveys include some aspects of transition to adulthood, dating and marriage, sexual behavior, fertility and contraceptive use, knowledge on reproductive health, substance taking such as smoking, drinking, and drug use, family characteristics, education, and employment.

For Indonesia, we use data from the Baseline Survey of Young Adult Reproductive Welfare (RRS) conducted by University of Indonesia's Demographic Institute (Lembaga Demografi) under the National Family Planning Coordinating Board (BKKBN). The survey collected information through interviews with 3,978 women and 4,106 men age 15-24 in West, Central, and East Java, and in Sumatra's Lampung Province in 1998.

For Nepal, we use the Survey of Nepal Adolescent and Young Adults (NAYA). The NAYA Survey was conducted in July and August 2000. The sample (actually interviewed) consists of 4,175 women and 3,802 men aged 14-22 in five urban districts and eight rural districts across the country, except the mountain ecological region that is sparsely populated (Thapa, Dhital, and Newpane 2001). The urban youth was over-sampled to allow reliable estimates for urban youth. Family Health International and the Valley Research Group conducted the survey. A more detailed analysis on smoking is reported in Choe and Thapa (2001).

For the Philippines, we use data from the second Young Adult Fertility and Sexuality Study (YAFS-II) conducted in 1994 by University of Philippines Population Institute. The survey interviewed a national sample of 5,266 men and 5,612 women age

15 to 24. See Ryamundo, Xenos, and Domingo (1999) for more details about the survey and the main findings.

For Taiwan, the 1994 Taiwan Young People Survey conducted by Taiwan National Institute for Family Planning is used. It consists of 884 men and 2,766 women of ages 15-29, a probability sample of residents in the Taiwan area. Most of the information in the survey was obtained by interviews. Selected items relating to more sensitive issues such as dating, sexual relationships, and substance use were filled out by respondents and collected in sealed envelopes.

For Thailand, the Family and Youth Survey of 1994 is used. The survey interviewed a national sample of 1,087 men and 1,092 women age 15 to 24. The Institute for Population and Social Research, Mahidol University, conducted the survey using interview methods. For more details about the survey and the main findings, see Podhisita and Pattaravanich (1995).

The samples from the Philippines, Taiwan, and Thailand are nationally representative samples. Indonesian sample is limited to non-metropolitan provinces of Java and one province in Sumatra. Nepal sample excludes mountain ecological region.

Our analysis is limited to smoking behavior of 15-19 year olds. Analysis of smoking behavior among young adults under age 20 is important. Studies document that most people who become habitual users of tobacco products begin smoking before they reach age 20 (CDC 1994). Separate analyses are done for men and women because preliminary analysis showed that patterns of smoking behavior are quite different among young men and women. For countries that utilized stratified sampling using varying sampling probabilities for different strata, we use sample weights in the analyses.

We first examine the prevalence of smoking and covariates of current smoking behavior. This is followed by an examination of how the community, family, and background characteristics of 15-19 year olds either increase their risk of smoking or protect them from smoking.

COUNTRY BACKGROUNDS

In general, the prevalence of tobacco smoking is high among the adult male population in these countries, and has been increasing in the recent years. The prevalence among adult

women is low in all countries except Nepal. Table 1 shows some background statistics about smoking in the five countries under study, compiled by the American Cancer Society (Corraro, Guindon, Sharma, and Shokoohi 2000).

Indonesia produces and exports large quantities of both tobacco leaves and cigarettes. The per capita consumption of cigarettes grew nearly three-fold between 1970 and 1998. It was estimated that in 1995, more than two-thirds of adult men (age 20 and over) and three percent of adult women were smoking (Corraro, Guindon, Sharma, and Shokoohi 2000, p.366).

Nepal produces some tobacco leaves. Cigarette production and imports have grown sharply since 1970. The per capita consumption of cigarettes grew more than three-fold between 1970 and 1996. In 1998 one out of every five adult men (age 15 or over) and one out of seven adult women were smoking (Corraro, Guindon, Sharma, and Shokoohi 2000, p.372). The prevalence of smoking among adult males is the lowest among the five countries in the study and the gender difference is the smallest.

Both tobacco leaves and cigarettes are produced in the Philippines. But imports of tobacco leaves and cigarettes outnumber their exports. Smoking prevalence in 1999 was very high among adult men, amounting to three quarters and substantial among adult women (Corraro, Guindon, Sharma, and Shokoohi 2000, p.418). The level of cigarette consumption did not change much since 1970, averaging about 2,000 sticks annually per person.

Taiwan produces some tobacco leaves and cigarettes but about one third of the cigarettes consumed in Taiwan are imported. Smoking prevalence is high among adult men but low among adult women. In 1996, it is estimated that a little more than half of men age 18 and over are smokers compared to 3 percent of women (Corraro, Guindon, Sharma, and Shokoohi 2000, p.388).

Thailand is a large tobacco export country but it also imports some tobacco leaves and cigarettes. Per capita consumption of cigarettes grew modestly between 1970 and 1995. In 1999, it is estimated that among adults age 11 and over, slightly more than one third of men 2 percent of women were smokers (Corraro, Guindon, Sharma, and Shokoohi 2000, p.476).

Most countries in Asia have very weak policies and programs for tobacco control, with the exception of Thailand and Hong Kong. The tobacco control programs in Thailand are reported to be comparable to the best in the word. Taxes on cigarettes are high, no advertisement of cigarettes in any media is permitted, and there are strong and varied warning labels on cigarette packets (Corraro, Guindon, Sharma, and Shokoohi 2000, p.38).

PREVALENCE OF YOUTH SMOKING

Current smoking status is obtained from responses to the questions phrased in slightly different ways in the five countries (Table 2). In general, variations of a simple question "Do you smoke currently?" was asked. In four of the five surveys used, current smoking status was asked after the questions on any experience of smoking. The exception is the Taiwan survey which asked the current smoking status first followed by the question on smoking experiences in the past. Only the Thailand survey defined the term "current" specifically: any smoking during the one-month period preceding the survey was defined as current smoking. In the other four surveys, the term "current" or "now" are used without specific time reference. In Nepal the question was on smoking cigarettes or *bidi*s. *Bidi*s are tobaccos (processed or unprocessed) folded in dry leaves and are smaller in size than cigarettes. They are produced and consumed primarily in South Asian countries.

Table 3 shows the prevalence of smoking among young men and women age 15-19 at the time of survey together with the year of survey and the sample size. Smoking prevalence among young men age 15-19 ranges from 12 percent in Nepal to 38 percent in Indonesia. Smoking prevalence is low among young women in all of the Asian countries under study. Relatively high prevalences are observed in Taiwan and Nepal. The gender differences are very large compared to the patterns in countries in Europe and the Americas (Corraro, Guindon, Sharma, and Shokoohi 2000; Kann et al. 1993; Kann el al. 2000). The gender difference is highest in Indonesia and lowest in Nepal. In general, women in South Asian countries are known to smoke more frequently than women in other Asian countries (Corraro, Guindon, Sharma, and Shokoohi 2000).

PARENTS' ATTITUDE

The views of youth on their parents' attitudes are expected to be highly associated with their own views of the social norm. Two surveys had information on parent's attitudes on youth smoking. In the Indonesian survey, respondents were asked if their father and mother allowed them to smoke during childhood (up to age 15). In the Philippines survey, respondents were asked if they thought their father and mother would approve or disapprove of their smoking.

Table 4 shows the percentages of fathers and mothers with permissive attitudes on their children's smoking. Indonesian parents are very permissive about their sons' smoking but not about their daughters' smoking. Seventeen percent of Indonesian young men but only 1 percent of young women age 15-19 reports that their fathers allowed them to smoke before age 15. Mothers' attitudes reported by these teenagers are virtually the same as their fathers' attitudes. In the Philippines, a sizable proportion of young men age 15-19 report that their fathers and mothers would approve their smoking. Similar to the situation in Indonesia, only one percent of young women report that their fathers and mothers would approve their smoking.

Parents' attitudes, as perceived by their children, are closely related to smoking behavior among 15-19 year old young men in Indonesia and the Philippines. There are possibilities of reporting bias on parent's attitudes: smokers are more likely to perceive their parents as having more permissive attitudes than non-smokers, the perception being incorrect for some respondents. Nevertheless, the strong relationship between parents' attitudes and children's behavior (Table 5) suggest that parents may be able to keep their children from smoking by holding firm attitudes against smoking and letting their children be aware of their attitudes.

COVARIATES OF SMOKING

We now examine how characteristics of the community and the family, as well as some individual characteristics are associated with the smoking behavior among 15-19 year olds. Smoking prevalence is likely to be high among youth who have easy access to tobacco products. In communities where tobacco is grown, young people may have easy access to tobacco products without having to buy them. Communities where permissive

attitudes prevail are likely to provide easy access to tobacco products by youth. In communities where most tobacco products are available through commercial channels, high economic status would provide easy access to tobacco products.

At family and individual level, studies in the U.S. and other countries have found that that individuals with certain characteristics such as low self-esteem, not feeling connected to family, school, and religion are likely to engage in risk taking behaviors such as smoking (Blum and Rinehart 1997; Domingo and Marquez 1999; Jessor, Donovan, and Costa 1991; Jessor and Jessor 1997; Jessor, Turbin, and Costa 1998; Resnick et al. 1997).

In the context of a high prevalence of smoking among adult men in these Asian countries, many young men are likely to begin smoking during their transition to adulthood. Young men and women who have attained certain adult status such as reaching legal adult age, completing education and being married are more likely to smoke.

We examine four sets of covariates. The first set consists of indicators of community characteristics. Urban communities are likely to be more tolerant of adolescent behaviors that do not follow norms. Youth in urban areas are more likely to find the time and place with little adult supervision, and have easier access to tobacco products than in rural areas. We expect that urban residence is associated with a higher probability of smoking. Access to tobacco products and tolerance toward youth smoking may vary by regions within a country Regional variations are likely to be larger in countries where national networks of transportation and communication are less developed. We, therefore, include variables indicating provinces in Indonesia and regions in Nepal for analysis. Preliminary analysis showed no substantial regional differences in smoking prevalence among youth in other countries.

The second set of covariates we examine are indicators of some aspects of connectedness of respondents to their parents. Whether the respondent spent most of the childhood with two parents, and the level of contact and communication with parents are used in the analysis models when available. Children who have weaker connection to their parents are more likely to engage in risk-taking behavior such as smoking than others.

We also include the levels of parents' education. Father's education can be regarded as a proxy for family's economic and social status. Mother's education is used as a measure of the parents' ability to understand the needs of adolescents and to provide appropriate guidance.

Two individual level variables, when available, are included in the analyses: educational aspiration and religiosity. Adolescents with high level of educational aspiration are less likely to initiate risk-taking behavior. Leaders of most religions discourage risk taking such as smoking. Strong religiosity is likely to be associated with a low probability of risk taking.

The last set of covariates we examine consists of life-cycle variables. Most adolescents and youth are likely to adopt behaviors that are very common among adults sometime during their transition to full adulthood, even when they are aware of some undesirable health consequences of these behaviors. Smoking is likely to be one of them. It is likely that the initiation of smoking is closely related to some markers of transition to adulthood such as reaching the socially and legally recognized age of adulthood, completion of education, leaving the parental home, and being married. Youth who have reached these stages of transition to adulthood are more likely to smoke than others. Employment is not included in our analysis models. A large proportion of youth in some countries work in the agricultural sector and the nature of employment in the surveys varies greatly in terms of whether the employment generates personal income and whether it is truly a marker of transition to adulthood.

We use logit regression models using current smoking status as the dependent variable. The actual set of covariates used for analysis varies slightly from country to country reflecting social, economic, and cultural situations, as well as the availability of data. In the following sections, analysis models for each country will be presented and the results will be discussed. Later, we try to summarize findings in terms of major similarities and differences across countries and gender of respondents.

INDONESIA

In Indonesia, only a handful of women in the sample age 15-19 are found to be current smokers. The analysis of covariates of smoking, therefore, is limited to men aged 15-19.

Table 6 shows the list of covariates included in the analysis, their mean values, and the estimated logit coefficients.

Two variables indicating the community are included: urban/rural residence and province of residence. Father's education and mother's education are classified as to whether they have more than primary school education or not. Three variables indicating closeness to parents are examined: whether the respondent was raised by two parents or not, whether the respondent had frequent conversations with father while growing up (up to age 15) or not, and whether the respondent had frequent conversations with mother while growing up or not. Stages of transition to adulthood are indicated by age, whether the respondent is in school or not, whether the respondent is married, and if not married, if he is living with parents or not.

Smoking prevalence does not vary with statistical significance by urban-rural residence, but its variation by province is statistically significant. The prevalence is highest in Lampung and lowest in Central Java. The Indonesia Demographic and Health Survey 1997 reports that compared to residents in Java, higher proportions of women in Lampung work in the agricultural sector, but among the agricultural employees, a higher proportion work on their own land (Central Bureau of Statistics, National Family Planning Board, Ministry of Health, and Macro International 1998). It is likely that youth in Lampung have easier access to tobacco products that are produced either on their family farms or in their community.

Parent's education has little effect on the smoking behavior of teenage boys, but one of the three measures of closeness to parents does. Boys who have had frequent conversations during childhood (up to age 15) are less likely to smoke at ages 15-19 than the boys who have not.

Three of the four indicators of transition to adulthood have statistically significant effects on smoking. Older age, being out of school, and being married increase the probability of smoking among 15-19 year old boys in Indonesia substantially. Living away from parents (for single men), however, does not have a statistically significant impact on current smoking status.

NEPAL

Table 7 shows the list of covariates used for the analysis of smoking in Nepal, together with the mean values and estimated logit regression coefficients. Three covariates describe the community: urban/rural residence, ecological region (Terai or Hill), and development region. Nepal consists of three ecological regions: Terai, Hill, and Mountains. Mountain region, which is sparsely populated, is not included in the NAYA survey. Terai region is the southernmost region of the country, bordering Northern India. Terai is the sub-tropical, mostly flat fertile land. Because of the proximity to the open border, Terai is influenced by the Northern Indian Hindu and Muslim cultures. In contrast, the Mountain ecological region is influenced by the Budhist culture of the Tibet region. The Hill ecological region, a mixture of the Hindu and Buddhist cultures, consists of numerous valleys including the capital (Kathmandu) and other urban areas, which are economically more modernized than other areas in the country. Nepal is known as a land of diversity: it has more than 60 ethnic, caste and tribal groups dispersed by a series of historical migratory processes throughout the country. Within the country, Mid-western and Far-western districts are considered much less developed than other districts (West, Central, and East) in terms of social and economic development (Thapa 1995). Among five countries under study, Nepal is most the underdeveloped and rural country. Within the country, Mid-western and Far-western districts are much less developed than other districts (West, Central, and East) in terms of economy, education, and social development (Thapa 2000).

Table 7 shows that smoking is more prevalent among Hill residents than among Terai residents. The population of Hill region is more diverse than the Terai region in its ethnic, caste, and religious composition. Attitude on smoking among youth may be more permissive in Hill region than in Terai region. The table also shoes that smoking is more prevalent in under-developed regions (Mid-Western and Far-Western districts) than in developed regions (Eastern, Central, and Western districts) for both young men and women. As discussed earlier, a substantial amount of tobacco leaves is produced in Nepal. Nepalese youth in less developed rural areas are likely to have easy access to tobacco products, which they do not have to pay cash for.

A high level of father's education has a positive relationship with smoking among young men and negative relationship with smoking among young women. Young men whose fathers have more than primary school education are more likely to smoke than those whose fathers have less education. This is probably because young men whose fathers have more education are economically better off and are able to buy cigarettes and *bidi*s. For young women, having fathers with more education may mean a higher level of parental supervision of their behavior.

Three of the four covariates indicating transition to adulthood have large impacts on smoking behavior. Smoking prevalence increases with age for both young men and young women. Young men and women who are out of school are much more likely to smoke than those who are still in school. Young men and women who are married are more likely to smoke than single men and women.

PHILIPPINES

Table 8 shows the list of covariates used for the analysis of smoking in the Philippines, together with the mean values and estimated logit regression coefficients. Residence has no effect on smoking behavior among young men age 15-19 in the Philippines, but has statistically significant effect on smoking behavior of young women. Young women in Manila are more likely to smoke than young women elsewhere.

Neither father's education nor mother's education has statistically significant effects on the smoking behavior of 15-19 year olds. Relationship with parents has some effect on smoking behavior of young women: women who are raised by two parents are less likely to smoke than women who are not raised by two parents.

Three of the four covariates marking transition to adulthood have statistically significant effects on smoking among young men: older age, being out of school, and living away from parents all increase the probability of smoking among men age 15-19. On the other hand, only age has statistically significant effect on smoking among young women.

Of two additional individual characteristics, planning to have college education is associated with a low prevalence of smoking among young men, but not among young

women. Being strongly religious (participating in religious activities once a week or more often) does not affect smoking behavior.

TAIWAN

Table 9 shows the list of covariates used for the analysis of smoking in Taiwan, together with the mean values and estimated logit regression coefficients. The Taiwan survey includes a number of variables describing the relationship of young people with their parents. The models presented in Table 9 include four such variables. Whether the respondent thought they spent a lot of time with their fathers and mothers are included. For our analysis respondents whose father (or mother) are not surviving any more are considered as not having a lot of time with them. We also included variables indicating whether the respondent said they would talk to father (or mother) when they are in trouble or are worried about something. The analysis models do not include mother's education due to its high correlation with other covariates already included in the model.

Among Taiwan youth, urban residence and father's education do not have statistically significant effects on smoking behavior. Of four variables describing relationship with parents, two have statistically significant effects on smoking behavior among young men. Having a lot of time with father lowers smoking prevalence, and talking to mother at times of trouble lowers smoking prevalence among young men. Among young women, only one of the four factors describing the relationship with parents is statistically significant: young women who talk to mothers at times of trouble are less likely to smoke.

One of the two variables describing transition to adulthood, age, is not statistically significant for either gender. Not going to school has large and statistically significant effect on smoking among young men and women in Taiwan.

THAILAND

Table 10 shows the list of covariates used for the analysis of smoking in Thailand, together with the mean values and estimated logit regression coefficients. Because only a few women age 15-19 were current smokers, the analysis of smoking behavior among Thai youth is limited to young men age 15-19.

The estimated effects of residence and parent's education on the smoking behavior of young men are not statistically significant. Whether young men get along well with father and mother, or whether they plan to go to college or not do not affect smoking behavior of young men either.

All three variables indicating stages of transition to adulthood have statistically significant effects on smoking behavior among young Thai men. Being older, being out of school, and having lived away from parents increase the probability of smoking.

SUMMARY

We now discuss how the effects of each covariate or set of covariates differ across countries. In the following discussions we show variations in adjusted probabilities of smoking by selected characteristics using multiple classification analysis. The adjusted probabilities are computed by the estimated logit models described in the previous sections by setting values of control variables at their sample means (See Retherford and Choe 1993, Chapter 5 for further explanation).

Urban Residence and Locality: Only among young women in the Philippines, urban residence has some effect on smoking. Young women aged 15-19 living in Manila are much more likely to smoke than young Filipino women living elsewhere. This finding indicates that modernization may increase women's smoking in the Philippines. Similar findings have been observed elsewhere in Asia such as South Korea (Han et al. 2001).

The variations in the prevalence of smoking by provinces in Indonesia and by districts and regions in Nepal show that smoking is more prevalent in agricultural rural areas where young people have easy access to tobacco products.

Parents' Education: Our analysis shows only weak associations between parent's education and the smoking behavior of young men and women. Only in Nepal, they are found to have statistically significant effects, but the effects on young men and on young women are opposite. For young men, the relationship is positive, and for young women, the relationship is negative. This is probably because young men whose fathers have more education are economically better off and have easier access to cigarettes and *bidi*s, but for young women, having fathers with more education may mean higher levels of parental supervision on their behavior.

Relationship with Parents. Some measures of how close the young men and women are to their parents are available for Indonesia, the Philippines, Taiwan, and Thailand. In Indonesia, the closeness to parents was measured by the variable indicating whether they had frequent conversations with father and mother while growing up. In the Philippines, closeness to parents was measured by whether the respondent was raised by two parents or not. Models for young men and women in Taiwan included two measures of closeness to each parent. One pair is whether the young men and women had a lot of time with their parents and the second pair is whether they talk to their parents in times of trouble. The Thailand survey had information on whether the respondent gets along well with his/her father and mother.

The effects of closeness to parents on smoking in these countries are summarized in Figure 1. Some measure of closeness to parents was available for analysis for 6 groups youth. Of them the measure was found to have statistically significant effects in four groups: Indonesian men, Filipino men, Taiwanese men, and Taiwanese women. In most cases, the effects are large.

Indonesian young men are less likely to smoke if they had frequent conversations with fathers while they were growing up. Filipino women who were raised by two parents have lower probability of smoking than young women who were not raised by two parents, but the covariate does not affect young men's smoking behavior. This is a relatively weak measure of closeness to parents. A better measure of closeness to parents may result in stronger relationship between closeness to parents and smoking behavior among youth. In Taiwan, having a lot of time with father lowers young men's smoking prevalence and talking to mother at times of trouble lowers smoking prevalence of both young men and women. Whether the respondent gets along well with his/her father and mother did not have statistically significant effects on smoking behavior among Thai young men.

Aspiration for college education. Data from Philippines, Taiwan, and Thailand have information on whether the respondent was planning to go to college. Among young men in the Philippines and young men and women in Taiwan those who plan to go to college are much less likely to smoke than those who do not. The effect is especially

large among Taiwan youth (Figure 2). Planning to go to college does not have statistically significant effect on smoking among Filipino women and Thai men.

School attendance. Being out of school increases the probability of smoking in seven groups out of the eight youth groups analyzed, with the exception of Filipino women. The effects are large in all seven groups (Figure 3). Completion of education is one of the key indicators of transition to adulthood. The effect of being out of school on smoking behavior tends to larger in countries where more young people age 15-19 are out of school (Indonesia and Nepal) than in countries where most youth age 15-19 are in school (Taiwanese men).

Marital status. Early marriage is quite common in Indonesia and Nepal, especially among women (Choe, Thapa, Achmad 2001). Our analyses show that being married is associated with higher prevalence of smoking in these countries (Figure 4).

DISCUSSION

In five Asian countries we examined, smoking is quite prevalent among young men age 15-19 but rare among young women age 15-19. It is likely that smoking prevalence among young women will increase in the future with continuing modernization of society. For example, the gender difference in smoking prevalence is has narrowed in more developed societies in Asia such as Japan and Hong Kong (Corraro, Guindon, Sharma, and Shokoohi 2000, pp.386, 394).

Although the young men and women are aware of the health risks associated with smoking, they take the risks of smoking at early ages. Health education programs need to provide realistic and personal messages about the risks associated with smoking.

In many Asian societies, smoking is very common and a large proportion of young children have easy access to tobacco products. Access to tobacco products for youth should be controlled strictly.

A large proportion of teen smokers may intend to quit smoking sometime in the future to avoid serious health consequences. Our data show, however, that most teens who have tried quitting have not succeeded. It is imperative that health education delivers strong messages about the health risks of smoking as well as the strong addictive nature

of smoking. It is important to help youth realize that they cannot just begin smoking, enjoy it for a while, and then quit.

Parents have potentially important roles in reducing youth tobacco epidemic. Having firm attitude against smoking, and having close relationships with their children are likely to reduce the probability of their children's smoking. Communities need to provide substitute roles of parents for youth who are not living with their parents.

Smoking is much more prevalent among youth who have experienced some transitions to adulthood such as leaving school, living away from parents, and having married. Smoking should not be considered as a symbol of adulthood. Educational systems, families, media, and community leaders and organizations need to work together to change the images of adulthood. They should also work together to provide alternatives activities to smoking for young adults.

High prevalence of smoking among married young women under age 20 calls for special needs in reproductive health programs. Young married women need to be informed about risks associated with smoking such as low birth weights and high probability of perinatal complications.

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Footnotes to Figure 1.

1. In Indonesia, the closeness to parents was measured by the variable indicating whether they had frequent conversations with father and mother while growing up.

2. In the Philippines, closeness to parents was measured by whether the respondent was raised by two parents or not.

3. Taiwan-1 indicates whether the respondent had a lot of time with his/her father and Taiwan-2 indicates whether the respondent talk to his/her mother in times of trouble.

Table 1. Selected background statistics on smoking in Indonesia, Nepal, Philippines, Taiwan, and Thailand.

	Indonesia	Nepal	Philippines	Taiwan	Thailand
Real GDP per capita (PPP)					
1970	$715	$670	$1,403	$2,188	$1,526
1998	$2,306	$1,226	$1,824	$12,181	$5,038
Smoking prevalence, 1999[a]					
Adult men[b]	69	20	75	55	39
Adult women	3	15	18	3	2
Annual per capita cigarette consumption					
1970	469	1,12	1,938	n.a.	796
1998	1,405	619[c]	1,849	n.a.	1,067[d]
Cigarette imports in 1998, sticks in millions	22	80	4,693	15,159	1,782
Cigarette exports in 1998, sticks in millions	24,019	1	1,392	15	181
Tobacco leaf production in 1998, metric tons	137,564	3,845	71,090	13,907	67,600
Tobacco leaf imports in 1998, metric tons	17,152	4,580	19,394	9,649	9,531
Tobacco leaf exports in 1998, metric tons	46,960	n.a.	13,767	2,015	24,738
Retail price of 20 cigarettes with tax, ca. 1999 (US$)					
Domestic brand	$0.61	$0.24	$0.61	$0.79	$0.73
Foreign brand	$0.73	$0.87	$0.80	$1.42	$1.09

Source: Corraro, Guindon, Sharma, and Shokoohi 2000, pp. 366, 372, 376, 388, 418.

Notes: a. Data for Indonesia is for 1995; data for Nepal is for 1998; and data for Taowam is for 1996.

b. Adults are defined as age 20 and over in Indonesia and Philippines, age 15 and over in Nepal, age 18 and over in Taiwan, and age 11 and over in Thailand.

c. For 1997.

d. For 1995.

Table 2. Questions asked to ascertain current smoking status, five countries in Asia

Country	Questions
Indonesia	Have you ever smoked? (If yes) Do you smoke at present?
Nepal	Have you ever smoked cigarettes or *bidis*? (If yes) Do you smoke now?
Philippines	Have you ever tried smoking cigarettes? (If yes) Currently, are you smoking cigarettes?
Taiwan	Do you smoke? (If no) Have you ever smoked?
Thailand	Did you ever smoke cigarettes? (If yes) How often did you smoke last month?

Table 3. Percentages of 15-19 year olds who are current smokers by gender

	Year of survey	Number of youth age 15-19	Percent currently smoking
Men			
Indonesia	1998	2,669	38
Nepal	2000	2,667	12
Philippines	1994	3,071	28
Taiwan	1994	297	30
Thailand	1994	644	33
Women			
Indonesia	1998	2,300	1
Nepal	2000	2,433	4
Philippines	1994	3,250	3
Taiwan	1994	989	5
Thailand	1994	756	2

Table 4. Parents' attitude on smoking reported by 15-19 year olds, Indonesia (1998) and Philippines (1994)

	Boys	Girls
Indonesia		
Father allowed smoking before age 15	17%	1%
Mother allowed smoking before age 15	17%	1%
Philippines		
Father would approve smoking	13%	1%
Mother would approve smoking	12%	1%

Table 5. Current smoking behavior of 15-19 year old boys in Indonesia (1998) and Philippines (1994) by father's attitude on smoking

Country and father's attitude	Percent smoking
Indonesia	
Father allowed smoking before age 15	73%
Father did not allow smoking before age 15	32%
Philippines	
Father would approve smoking	81%
Mother would approve smoking	19%

Table 6. Mean values and estimated effects of covariates (logit coefficients) of current smoking among 15-19 year old boys, Indonesia 1998

Covariate	Mean value	Logit coefficient
Urban residence	0.28	0.1466
Province of residence (ref. is Central Java)		
Lampung	0.21	0.8773*
West Java	0.40	0.3151*
East Java	0.16	0.4309*
Father has more than primary school education	0.09	0.3089
Mother has more than primary school education	0.04	0.1661
Raised by two parents	0.85	0.0486
Had frequent conversations with father up to age 15	0.73	-0.1019
Had frequent conversations with mother up to age 15	0.86	-0.3198*
Age of respondent	16.8	0.4020*
Not in school	0.41	1.1841*
Married	0.01	1.8027*
Not married, not living with family	0.10	0.2107
Constant	1.00	-7.0038*

Table 7. Mean values and estimated effects of covariates (logit coefficients) of current smoking among 15-19 year old boys and girls, Nepal 2000

	Mean value		Logit coefficent	
Covariate	Boys	Girls	Boys	Girls
Urban residence	0.14	0.12	0.3557	-0.7680
Terai region (ref. is Hill)	0.51	0.48	-0.5378*	-1.7191*
Underdeveloped region	0.16	0.15	0.6723*	0.5637*
Father's education > primary	0.25	0.27	0.5848*	-0.9741*
Mother's education > primary	0.06	0.05	-0.0251	-0.0656
Raised by two parents	0.88	0.86	-0.1293	-0.2717
Age of respondent	16.8	16.7	0.2945*	0.2121*
Not in school	0.61	0.40	1.5022*	2.1505*
Single, living away from family	0.03	0.02	-0.5364	1.1379
Married	0.14	0.37	0.7017*	1.3800*
Constant	1.00	1.00	-6.3253*	-6.4154*

Table 8. Mean values and estimated effects of covariates (logit coefficients) of current smoking among 15-19 year old boys and girls, Philippines 1994

Covariate	Mean value		Logit coefficent	
	Boys	Girls	Boys	Girls
Residence (ref. is rural)				
Manila	0.09	0.11	-0.2139	1.0932*
Other urban areas	0.44	0.46	0.1115	0.3878
Father has college education	0.15	0.14	0.1991	0.2640
Mother has college education	0.15	0.14	-0.0550	0.2513
Raised by two parents	0.86	0.83	-0.0724	-0.4890*
Strongly religious	0.22	0.27	-0.2007	0.0687
Planning to go to college	0.52	0.59	-0.4007*	-0.2775
Age of respondent	16.9	16.8	0.3140*	0.2648*
Ever lived away from parents	0.29	0.41	0.3936*	0.0569
Married	0.02	0.08	0.3724	0.4924
Not in school	0.60	0.65	0.7468*	0.0408
Constant	1.00	1.00	-6.5255*	-7.9911*

Table 9. Mean values and estimated effects of covariates (logit coefficients) of current smoking among 15-19 year old boys and girls, Taiwan 1994

	Mean value		Logit coefficent	
Covariate	Boys	Girls	Boys	Girls
Urban residence	0.50	0.51	-0.0557	-0.2815
Father has college education	0.12	0.10	-1.0679	0.5530
Have a lot of time with fathers	0.73	0.70	-0.8662*	-0.1380
Have a lot of time with mother	0.85	0.86	0.3085	-0.3465
Talk to father when in trouble	0.26	0.21	0.1618	-0.6805
Talk to mother when in trouble	0.44	0.52	-1.3969*	-0.6935*
Planning to go to college	0.47	0.44	-0.9585*	-1.2390*
Age of respondent	16.8	17.0	0.1205	-0.2280
Not in school	0.77	0.81	1.4770*	1.3683*
Constant	1.00	1.00	-0.4586	2.9724

Table 10. Mean values and estimated effects of covariates (logit coefficients) of current smoking among 15-19 year old boys, Thailand 1994

Covariate	Mean value	Logit coefficient
Residence (ref, is rural)		
Bangkok	0.20	0.0961
Other urban areas	0.29	0.0570
Father has college education	0.08	0.2088
Mother has college education	0.06	-0.2363
Planning to go to college	0.47	-0.6080
Gets along well with father	0.76	-0.2058
Gets along well with mother	0.86	0.0480
Age of respondent	16.8	0.3805*
Not in school	0.55	0.7598*
Ever lived away from family	0.37	0.5576*
Constant	1.00	-7.8023*

Figure 1. Estimated adjusted percentages of smokers among 15-19 year olds by indications of closeness to parents

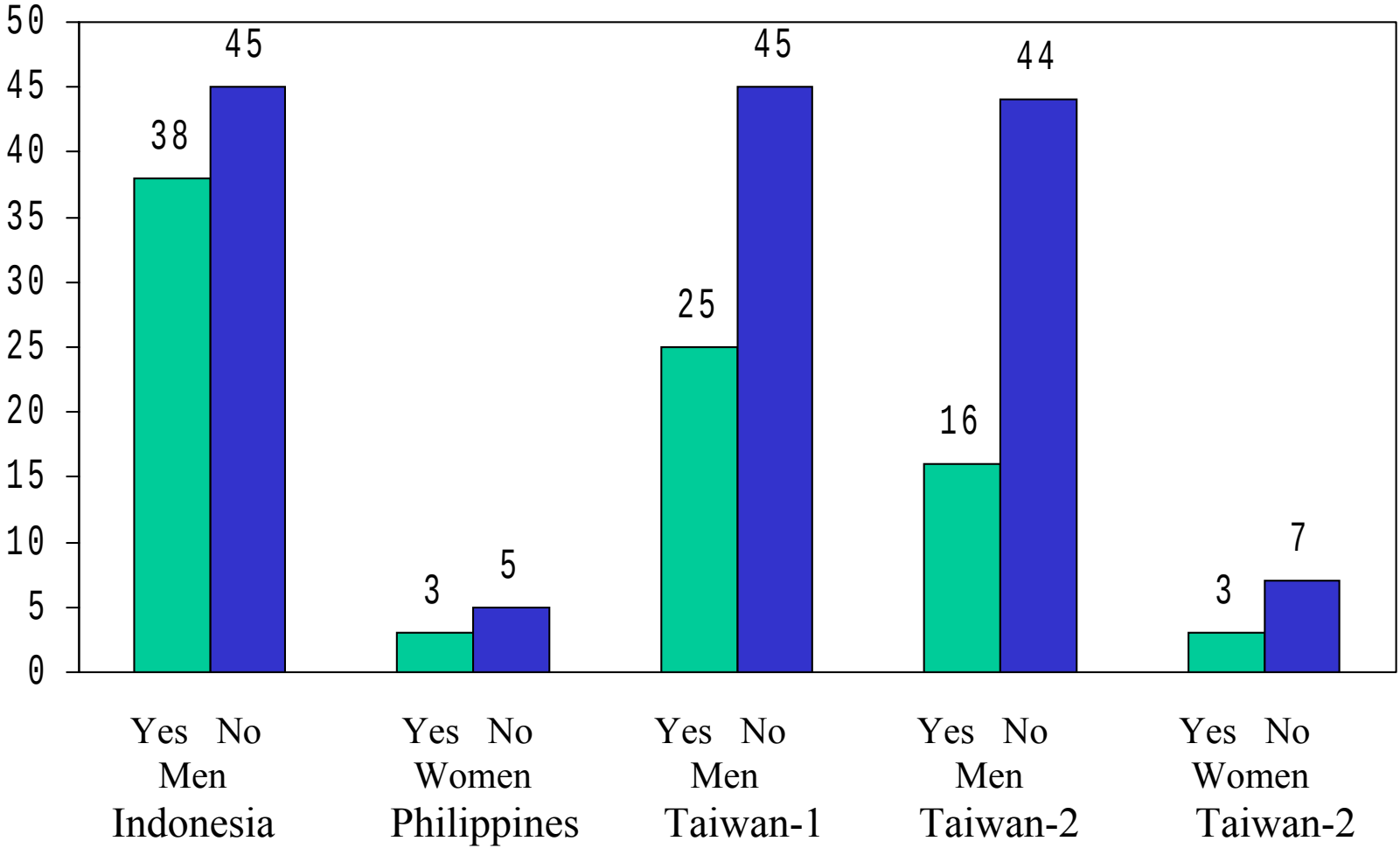

Figure 2. Estimated adjusted percentages of smokers among 15-19 year olds by whether they are planning to go to college

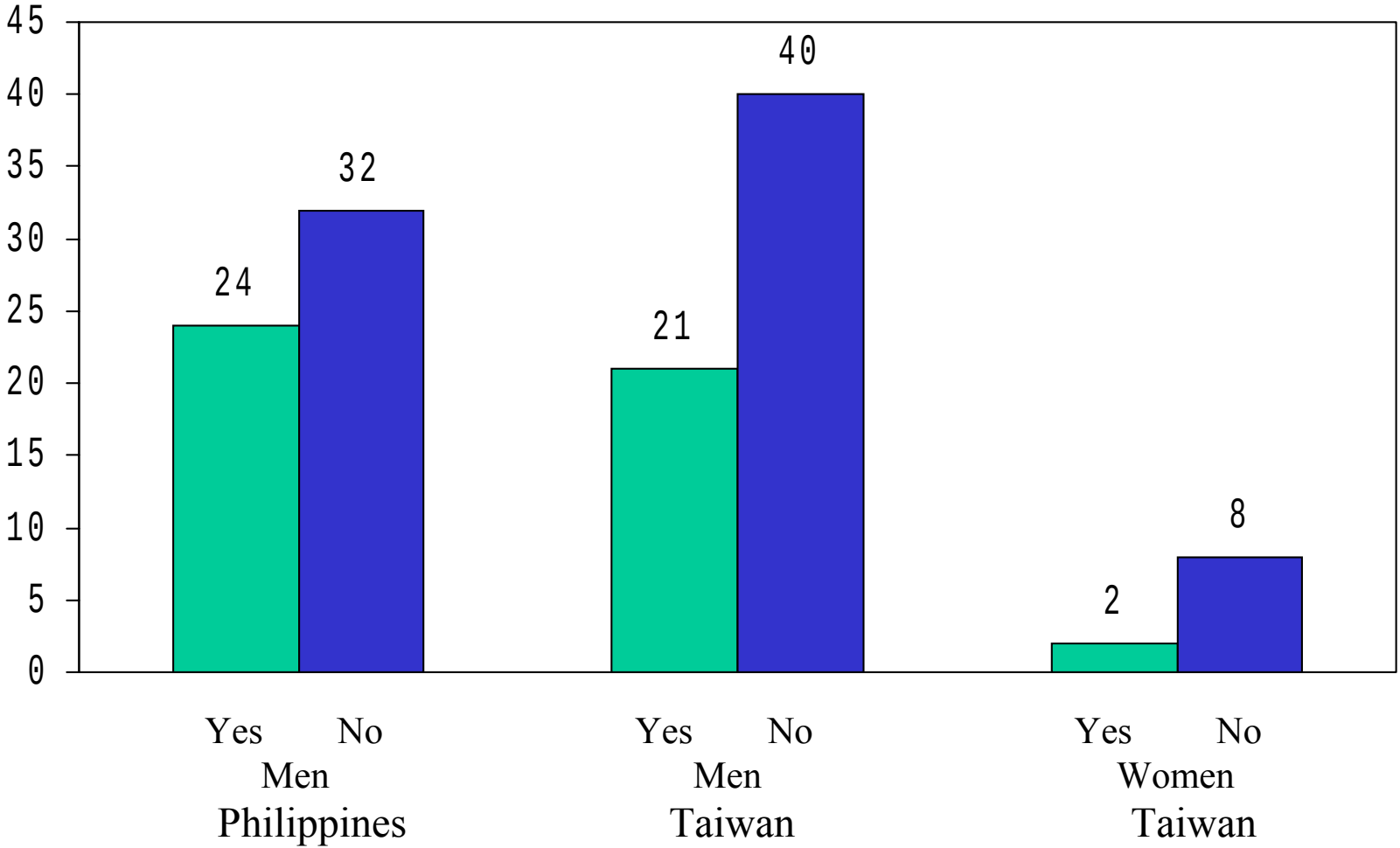

Figure 3. Estimated adjusted percentages of smokers among 15-19 year olds by whether they are attending school or not

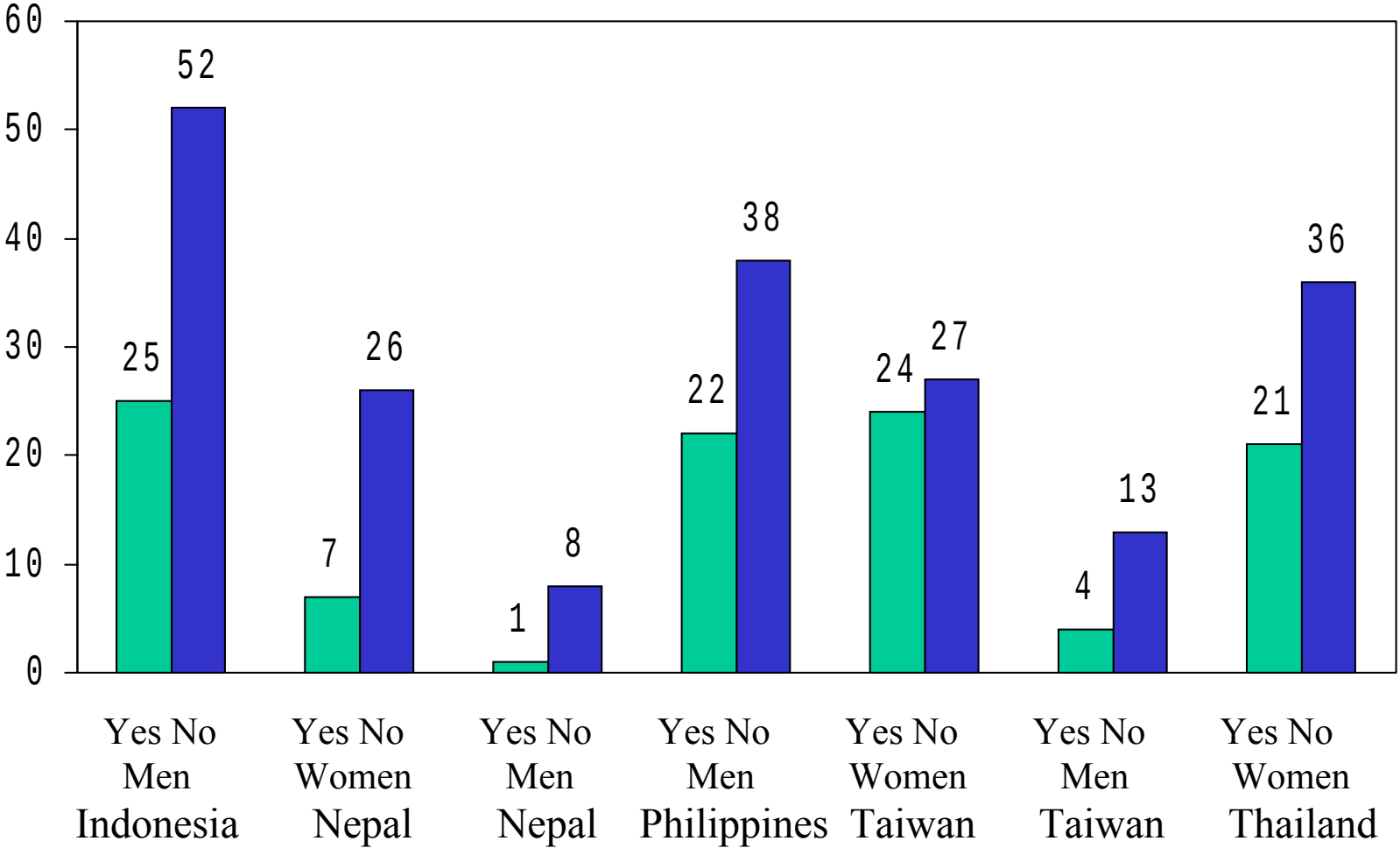

Figure 4. Estimated adjusted percentages of smokers among 15-19 year olds by marital status