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Cross-National Comparison and the Importance of Sub-Groups Within Countries

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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.

Cross-National Comparison and the Importance of Sub-Groups Within Countries

by

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Cross-national comparison of young adult data is a routine part of the global policy discourse on young adult reproductive health issues. Available to the interested reader are numerous presentations of national indicators in a comparative format. It is nevertheless recognized by all of us that cross-cultural, cross-national comparison is inherently difficult. The challenges have been reduced by Dogan and Kazancigil (1994) to those of measurement, of meaning, and of methodology, where the latter refers broadly to the design of comparisons. One set of design issues relates to the number of national cases under study (Ragin 1991). The alternatives range from the single-country Case Study, to Small-N designs, to Many-N designs, to the construction of "league tables."[1] Small-N designs involve few enough countries that they still can be understood as whole cases. Many-N designs involve too many for such holistic understanding, but perhaps too few for effective multivariate statistical analysis. The so-called Large-N design involves far too many cases for meaningful consideration of specific national realities, and thus total dependence on statistical summaries. But, then, what is the preferred, most effective approach to cross-national comparison?

Ragin identifies the fundamental tradeoff at work. He argues that true "…comparativists treat cases as whole entities. There is the presumption of meaningful "cases," distinct, singular entities (major events . . . cultures . . .) that parallel each other in meaningful ways that motivates comparison". He contrasts this with the "radically analytic" statistical analysis of large Ns--the league table approach—in which cases are fully decomposed into variables and thus rendered invisible. But, he continues, a primary goal of comparative social science is to make general statements about relationships, and this requires the use of concepts measured by variables. Thus the problem of balance between cases and variables.

It has been observed that cross-national comparison often involves two or perhaps three countries, or very many countries, but far less often an intermediate number of national cases (Ragin 1989; Bollen, Entwistle and Alderson 1993). In our AYARR comparative study of six Asian countries we fall squarely into the analytic gap identified by these

[1] This is a derisive label (Jowell 1998 and others) implying blind and perhaps pointless juxtaposition. The term belies the value of even relatively uncritical side-by-side comparisons; still, there is a warning here worth noting.

authors. We are looking at six societies. We know them well and seek to treat them holistically. That is a major operating principle of our comparative analysis project.[2] At the same time, though, we seek ways of comparing them systematically using the appropriate statistical tools. The present report, aimed at this second goal, is definitely in the "radically analytic" or "league table" genre of "radical reduction" of cases into variables. The kind of analysis reported here cannot alone provide in-depth understanding of Asian societies, but it can provide some very helpful context and background to such intensive study.

What Should We Compare?

It is a fundamental presumption of cross-national comparisons that "nations" are meaningful units, for which suitable measures can be obtained. Imbedded in this is the further presumption that within-nation variations on matters of interest are not so great as to render the cross-national comparisons suspect or even useless. In this note it is argued that on the dimensions that are examined here-- patterns of marital or union timing and the timing of sexual onset-- intra-country variations are indeed substantial as illustrated by data for four of the AYARR survey countries. But rather than conclude that cross-national comparison is meaningless, we prefer to view these intra-country variations as an additional element of the total comparative picture, to be examined and interpreted along with national-level statistics. The larger theoretical and methodological problem is that of understanding pattern at the individual level and at various contextual levels (social categories, countries) where higher contextual levels serve as influences on lower levels and on individual behavior. This Research Brief provides a straightforward illustration of these issues based on four of the AYARR data-sets.

Cast in this way, it is the task of comparative investigation to bring into coherence observations drawn from multiple levels of observation for multiple national entities. Using the AYARR surveys we are able to disaggregate national statistics in a number of simple but useful ways, but for a more limited set of disaggregations we can compare four countries with apparent precision because the same information is available for each country. Two of the simplest and most useful of these disaggregations-- by level of education and by urban versus rural residence-- are examined here.[3] In this manner, four important population groups within each of four countries are identified: urban residents with high educational levels and low educational levels, and rural residents in the same educational categories.

First we look in Table 1 at the distribution of the national youth populations of interest across the four social sub-groups defined by treating the two dimensions jointly as one classification. There are very large differences across the four countries. For example, the highly educated urban youth population makes up well over half of Taiwan youth ages

[2] The AYARR (Asian Young Adult Reproductive Risk project) is described in a project website (http://pisun2.ewc.hawaii.edu/ayarr/), which also provides documentation on our surveys and project reports.

[3] Education is measured by years of schooling completed, divided at under seven years versus seven years or more; urban and rural are distinguished differently in each country but it is generally felt (United Nations 1969: Chapter 1) that this actually provides the greatest comparability, because appropriate definition is compared with appropriate definition.

20-24, but only around 15 percent of that group in Thailand. In between are Indonesia where somewhat more than 20 percent of the group are highly educated and urban, and the Philippines where somewhat over 40 percent are highly educated and urban. Some of this cross-country variation reflects levels of urbanization. For example Thailand's 18-22 percent urban is well below the 51-60 percent levels of the other countries. This suggests other contrasts which become evident with a little arithmetic. In Taiwan virtually all rural youth are relatively highly educated, while in Thailand only half are. And, the urban population of Indonesia has a high proportion with low educational levels compared with the other countries (some 57 percent). All these differences reflect diverse historical paths toward national development and challenge any cross-national comparisons we try to make from contemporary cross-section data such as are provided by the AYARR surveys.

We now examine in an illustrative manner the pattern of just two behavioral dimensions in relation to these variations: marriage timing, and the timing of first sexual intercourse experience. Marriage timing is measured by the percentage of females ages 20-24 who were in a union by age 18, an index of the prevalence of relatively early marriage. The timing of sexual onset is measured by whether respondents ages 20-24 reported having a sexual intercourse experience by age 20 or not. This last indicator is examined for males as well as females. We look at four of the six AYARR countries: Indonesia, the Philippines, Taiwan and Thailand.[4]

Results

We find that the greatest regularity is achieved by ordering the population groups from "urban-high education" through "rural-high education," through "urban-low education" to "rural-low education." Even these simple population classifications and behavioral measures provide some useful results which are presented descriptively here in a series of figures.

Among youth ages 20-24, the percentage in a marital union by age 18 varies markedly and systematically across the four sub-groups, and does so (with only one departure) in the same manner in each country (Figure 1). The greatest differential is in Indonesia, where a negligible percentage of the urban educated had married by age 18, while nearly 80 percent of the rural, low-education group had married by age 18. The intermediate categories are in the 50-60 percent range on marriage timing. In the Philippines the same pattern overall is evident though the percentages marrying by age 18 are much lower. In Taiwan the differentials, though similar in pattern, are relatively muted except for the rural-low education category.[5] Finally, in Thailand we find a departure from the general pattern. Early marriage is relatively common among urban residents with high education (more common than in any of the population sub-groups in the Philippines, for example) but is relatively uncommon among highly educated rural residents.

[4] Hong Kong has no rural sector, and the Nepal data were not available for this analysis.
[5] The missing bar reflects that there are insufficient cases to provide an estimate.

The same sort of presentation for the female percent sexually active by age 20 (Figure 2) brings out one additional observation: urban, low-education respondents in Indonesia have an unexpectedly high percentage sexually active. Figure 3 presents these same results for males, and here we find a rather different pattern of differentials. The male differentials are all muted and somewhat obscured by variations, and insofar as there is a pattern it is the reverse of that for females. That is, early sexual onset is generally a bit less common among rural low-education males than among urban-high education males.

One implication of this sex difference in patterns is that the age difference in sexual onset between males and females must be very different in each of the population groups. The pattern is portrayed in Figure 4 showing the population sub-groups for each of the four countries. The pattern is relatively clustered for Taiwan and relatively dispersed for the other countries. Most importantly, the intra-country variation that exists is much greater for females than for males. In the case of Indonesia, this may reflect the fact that very few Indonesian males in any sub-group are sexually active by age 20. But, the same is found for the Philippines, and to nearly the same degree for Thailand, both countries where significant proportions of both males and females are sexually active by age 20.

There are some patterns in these data that may be worth exploring further. For example, the shift from rural and low education toward urban and high education is associated with divergence of males and females in one instance (Thailand) and convergence in another (Indonesia). The other two countries show a relatively minor shift across the diagonal in one direction (Philippines) or the other (Taiwan). The explanation seems to be somewhat different for each of the countries. For example, Indonesia's convergence occurs because with more urban residence and education females marry and initiate sex much later while the male shift is minimal.

Standardized Comparisons Across Countries

A simple "compositional" approach can be taken to sorting out what the national differences on certain criterion characteristics are, and how these differences may be influenced by each country's internal composition on residence and schooling. The standardized comparisons in Table 2 were obtained by imposing on each country the compositional features of one of them, thus "standardizing" on joint residence-schooling composition. Keeping in mind that Taiwan's population is more urban and more highly schooled than any of the other populations, with the Philippines not far behind, we see that in the adjusted results for three female indicator variables, the three other countries have much lower percents married at ages 15-19 (especially Indonesia and Thailand), lower levels of marriage by age 18 (especially Indonesia), and lower levels of females sexually active by 20 (especially Indonesia and Thailand). In contrast, there is an interesting mixed result for males sexually active by age 20. The Indonesian level is lowered, but the levels for the Philippines and Thailand are raised, Thailand's level by a significant amount. This reminds us again that when we look at national differences we are seeing a mix of several different influences one of which is compositional differences. Nevertheless, in the standardized comparisons the ordinal positions of the countries are generally maintained though their levels are often changed considerably.

An Analysis of Variance Approach

The casual assumption for many readers might be that on a characteristic such as the age at first sex, the difference between males and females would be considerable, perhaps as great, even greater, than differences in the averages for countries. Other factors such as level of education and urban versus rural residence might be important as well, but probably less important than the country in question and whether we are looking at males or females. In this section we report a formal decomposition of the overall variance in the two population characteristics in order to see if such casual conclusions are warranted. Our focus is on the strength and persistence of country differences versus other differences, since whether country differences are important relative to other factors is a crucial issue in cross-national comparisons.

We have pooled four of the six AYARR data files: those for Indonesia, Taiwan, the Philippines and Thailand.[6] These country data provide full information on the two dependent variables and also on urban versus rural residence, years of schooling completed, and sex. Models have been estimated using dummy variable coding of these factors. For sex, the omitted category is female, so coefficients indicate the effect of being male in comparison with being female. For residence the omitted category is rural and the coefficients indicate the effect of living urban. For education the omitted category is low education (below six years of schooling completed), so the coefficients indicate the effect of having completed schooling in excess of that. The country variable was coded as a set of four dummy variables with the Indonesia dummy variable omitted from the models, so that each country coefficient indicates the effect of being in that national sample versus being in the Indonesia sample. Only cases ages 20-24 were included, in order to minimize any associations between any of these variables and current age.

Tables 3.A and 3.B summarize the results of regressions on age at first sex. In part A we focus on the Country effects. Column (1) reports results for a model with only Country dummy variables included. This shows the effects of Country membership across the pooled dataset. Column (2) shows the results for a model with all the factors in the model simultaneously (detailed effects results are shown only for the Country dummy variables). Column (3) shows the results of a model containing all the factors simultaneously, but excluding the Country dummy variables. Column (1) indicates the total effects of Country membership. Comparison of columns (2) and (3) indicates the effects of Country membership net of all the other factors. Table 3.B is formatted in the same manner, but here the focus is on the other variables in the model: Sex, Education, Residence.

The overall multivariate explanatory power of these attempts to model the age at sexual onset is weak at best. No more than 4-5 percent of all variance in age at sexual onset is explained by any of them. At the same time, every model reflects patterns that are very

[6] With weights proportional to national youth populations multiplied against each survey's own internal weights.

unlikely to occur randomly. Each model has an F statistic which is statistically significant, and many of the regression coefficients (b's) shown are statistically significant at a high level. It is particularly important that Country as a factor shows significant effects, whether we are considering total, net, or partial effects. Indeed, there are country differences which are substantial in magnitude and by and large not explained by country differences in the other variables. For example, the mean age at sexual onset is 1.47 years later in Taiwan than in Indonesia, and even net of the other characteristics as they differ across the populations there remains a difference between these countries of 1.29 years.

In Table 3.B we can see that the effects of sex, educational level and residence are considerably smaller than the effects of country of residence. All three variables have statistically significant effects: males have a higher mean than females by 0.26 years; high education a later mean than low education by 0.76 years, and urban residence a higher mean than rural residence by 0.25 years. Notably, however, the effects of these variables are very much diminished in a multivariate context. The net effects of education and residence are not statistically significant, and that for sex is statistically significant but much smaller.

In the same format we present regressions on age at union in Tables 4.A and 4.B. The results here are in many respects similar to those for age at first sex, and in particular the country effects are large and statistically significant here as well. In fact they are somewhat larger, as are the coefficients indicating the effects of the other classifications as well. Overall, age at union is much more predictable on the basis of the classifications we are examining than is age at first sex. The inter-group differences are greater, including the inter-country differences, and some 11-19 percent of the overall variance in age at union is explained, compared with only 4-5 percent of the overall variance in age at first sex. Also notable is the fact that country differences in age at union are of magnitudes similar to the other differences in Table 3A and 3B, but country differences in age at first sex are much larger than the other category differences shown.

These data give us some alternative ways of thinking about inter-country and other inter-group differences, beyond the conventional comparisons of national statistics. Two views of the same set of differentials are depicted in Figures 4 and 5, were we are looking at male and female levels on the percentage sexually active by age 20. In Figure 4 country comparisons are emphasized. Two observations emerge here that would not be noticed otherwise. The first is that among sub-groups at progressively higher levels of urbanization and education, there is convergence of male and female levels. The second is that Thailand is a clear exception to this pattern. There the two sexes diverge with higher levels of urbanization and education.

In Figure 5 population sub-group comparisons that cut across countries are emphasized. For example, when we compare the Urban/High Education groups in the four countries, we find that they are fairly similar except for Thailand males with their relatively high percent sexually active by age 20. When we compare the four groups with Rural/Low Education, we find that these also are relatively clustered with one exception. Here it is

the Indonesian female group which stands out, with its very high prevalence of sexual onset by age 20. We know from other analysis including papers presented at this conference, that the Thai male pattern reflects their high level of premarital sex, while the Indonesia female pattern reflects relatively early entry to marriage.

We have found that the effects of Country are relatively large and relatively persistent even with multivariate controls. But we have also found that there is much to be explained beyond the variables we have examined. That is, within the population groups defined by these models (Thai, urban males with high educational levels, for example) is much variability in age at union and sexual onset that we would like to understand better. The single-country, national studies carried out under AYARR each take advantage of a national survey to pursue an issue in depth for one country (e.g.: Podhisita, Xenos and Varangrat 2001 on sexual risk-taking in Thailand; Podhisita, Xenos, Juntarodjana and Varangrat 2001 and Choe and Raymundo 2001 on substance risk-taking in Thailand and the Philippines, respectively; Cruz, Laguna and Raymundo 2001 youth lifestyles in the Philippines; and Choe and Lin 2000 on pre-marital sex and the family in Taiwan.

Conclusion

We might pursue a number of research leads at this point, generally having a multilevel character: how is personal decision-making about marriage and sexual initiation different in the different sub-groups? How are the "same" sub-groups different in the several countries? And so on. But instead, we return to the core issue: how does one conduct comparative analysis and arrive at relatively general conclusions in this comparative context?

All meaningful social analysis is perforce comparative. Throughout the 1960s and 1970s there was an outpouring of theoretical and methodological writing on comparative analysis of surveys, the overarching conclusion of which being that such research requires no special methodology, though international comparisons undoubtedly might be more complex due to the markedly different contexts being examined (Przeworski and Teune 1970). Nevertheless, comparative methodology is hotly debated still (Przeworski and Teune 1970; Bollen, Entwistle and Alderson 1993). The field has flourished, in part because international survey data collection has flourished, abetted by technological and methodological advances. The World Fertility Survey and the Demographic and Health Survey are prime examples. They permit analysts to assemble data for many countries showing response patterns to very similar questions as obtained from survey questionnaires. Many of the most prominent comparative reviews of YARH issues are constructed around DHS-based tabulations of the same indicators for many countries. But we recognize that standardized questionnaires may be skimming the surface in each national setting and providing only for the juxtaposition of national statistics into "league tables" (Jowell 1998). The AYARR surveys have taken a somewhat different tack, trading some comparability for greater analytic depth for each of the countries.

We should consider the warning "no safety in numbers," issued by comparativists such as Charles Tilly (1984):

> As we move toward the identification of historically specific regularities in social structures and processes, we should also move away from the habit of packing large numbers of cases into extensive statistical analyses. On the whole, comparative studies of big structures and large processes yield more intellectual return when investigators examine relatively small numbers of instances." (76 ff.)

There may be some throwing out of baby with bath water here, but there is also a useful caution, echoed by others. Ragin (1989) has noted that cross-national comparison has often involved two or perhaps three countries, or very many countries, but far less often an intermediate number of national cases (also see Bollen, Entwistle and Alderson 1993). The reason, they argue, is that analysts cannot explore and comprehend the subtleties of a large number of settings simultaneously. One either looks carefully at a small number of cases, or superficially at a large number of cases. As Jowell (1998) has stressed, effective cross-national comparative analysis requires cross-national collaboration—in design, development, execution, analysis and interpretation. Only this will provide for the "culture-specific adjustments" (Kuechler 1998) needed for real understanding. We believe that AYARR represents just this kind of cross-national, comparative, collaborative enterprise.

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Table 1. The Distribution of National Youth Populations Ages 20-24 by Residence and Level of Education

Country and Sex	TOTAL[a]	High Education		Low Education	
		Urban	Rural	Urban	Rural
Indonesia					
Male	100.0	22.5	35.7	33.4	6.3
Female	100.0	23.0	32.1	37.0	7.6
Philippines					
Male	100.0	44.2	30.6	7.3	13.8
Female	100.0	46.7	33.9	7.2	8.9
Taiwan					
Male	100.0	57.5	39.8	0.0	1.2
Female	100.0	55.2	35.7	2.4	3.7
Thailand					
Male	100.0	16.4	39.0	6.2	38.5
Female	100.0	13.5	30.1	5.6	50.3

Note:
a. Residuals reflect cases with no information

Source: AYARR Surveys data files.

Table 2. Some Standardized Comparisons of Countries on Selected Behavioral Indicators.

INDICATOR AND COMPARISON	COUNTRY			
	Taiwan	Indonesia	Philippines	Thailand
Percentage of Females Ages 15-19 Married or Cohabiting				
Observed	2.66	23.57	8.08	23.76
Standardized[a]	2.66	13.05	6.96	7.05
Percentage of Females Ages 20-24 In a Marital Union by Age 18				
Observed	14.29	46.42	7.89	17.55
Standardized[a]	14.29	28.08	6.44	14.63
Percentage of Females Ages 20-24 Sexually Active by Age 20				
Observed	16.80	64.31	26.57	34.84
Standardized[a]	16.80	40.68	24.15	17.88
Percentage of Males Ages 20-24 Sexually Active by Age 20				
Observed	17.69	9.87	31.97	55.56
Standardized[a]	17.69	6.39	32.85	62.45

Note:
a. Standardized on the joint distribution by residence and education among females ages 20-24 (c.f. Table 1)

Table 3.A Modelling Results for Least Squares Regression of Age at First Sex on Country, Sex, Education and Residence: Four Countries of Asia

Factor(s) of Interest and Model Statistics	Model					
	Factor(s) Alone		Full Model			
			All Factors		Excluding Factor(s) of Interest	
	(1)		(2)		(3)	
Country						
R	.207		.212		.141	
R^2	.043		.045		.020	
b Coefficients						
Taiwan	1.473	*	1.288	*	---	
Philippines	.872	*	.784	*	---	
Thailand	.170		.119		---	
Indonesia	---		---		---	
Sums of Squares	1125.196		1179.114		522.439	
Mean Squares/df	375.065	(3)	196.625	(6)	174.146	(3)
F	72.795		38.227		33.009	
Sig. Level	.000		.000		.000	

Table 3.B Modelling Results for Least Squares Regression of Age at First Sex on Country, Sex, Education and Residence: Four Countries of Asia

Factor(s) of Interest and Model Statistics	Model					
	Factor(s) Alone		Full Model			
			All Factors		Excluding Factor(s) of Interest (i.e. country only)	
	(1)		(2)		(3)	
Sex, Education, Residence						
R	.141		.212		.207	
R^2	.020		.045		.043	
b Coefficients						
Sex						
Male	.264*		.176*		---	
Female	---		---		---	
Education						
High	.755*		.191		---	
Low	---		---		---	
Residence						
Urban	.246*		.069		---	
Rural	---		---		---	
Sums of Squares	522.439		1179.114		1125.196	
Mean Squares/df	174.146	(3)	196.625	(6)	375.065	(3)
F	33.009		38.227		72.795	
Sig. Level	.000		.000		.000	

Note: Total sums of squares is 26,313.348

Table 4.A Modelling Results for Least Squares Regression of Age at Union on Country, Sex, Education and Residence: Four Countries of Asia

Factor(s) of Interest and Model Statistics	Model					
	Factor(s) Alone		Full Model			
			All Factors		Excluding Factor(s) of Interest	
	(1)		(2)		(3)	
Country						
R	.327		.434		.364	
R^2	.107		.189		.132	
b Coefficients						
Taiwan	2.471*		1.819*		---	
Philippines	1.488*		1.175*		---	
Thailand	1.455*		1.330*		---	
Indonesia	---		---		---	
Sums of Squares	2496.782		4401.288		3087.679	
Mean Squares/df	832.261	(3)	733.548	(6)	1029.092	(3)
F	149.353		144.770		190.092	
Sig. Level	.000		.000		.000	

Table 4.B Modelling Results for Least Squares Regression of Age at Union on Country, Sex, Education and Residence: Four Countries of Asia

Factor(s) of Interest and Model Statistics	Model					
	Factor(s) Alone		Full Model			
			All Factors		Excluding Factor(s) of Interest (i.e. country only)	
	(1)		(2)		(3)	
Sex, Education, Residence						
R	.364		.434		.327	
R^2	.132		.189		.107	
b Coefficients						
Sex						
Male	1.663*		1.549*		---	
Female	---		---		---	
Education						
High	1.446*		.759*		---	
Low	---		---		---	
Residence						
Urban	.604*		.397*		---	
Rural	---		---		---	
Sums of Squares	3087.679		4401.228		2496.782	
Mean Squares/df	1029.226		733.548		832.261	(3)
F	190.226	(3)	144.770	(6)	149.353	
Sig. Level	.000		.000		.000	

Note: Total sums of squares is 23,325.203

Figure 1. Percentage of Females 20-24 in a Marital Union by Age 18

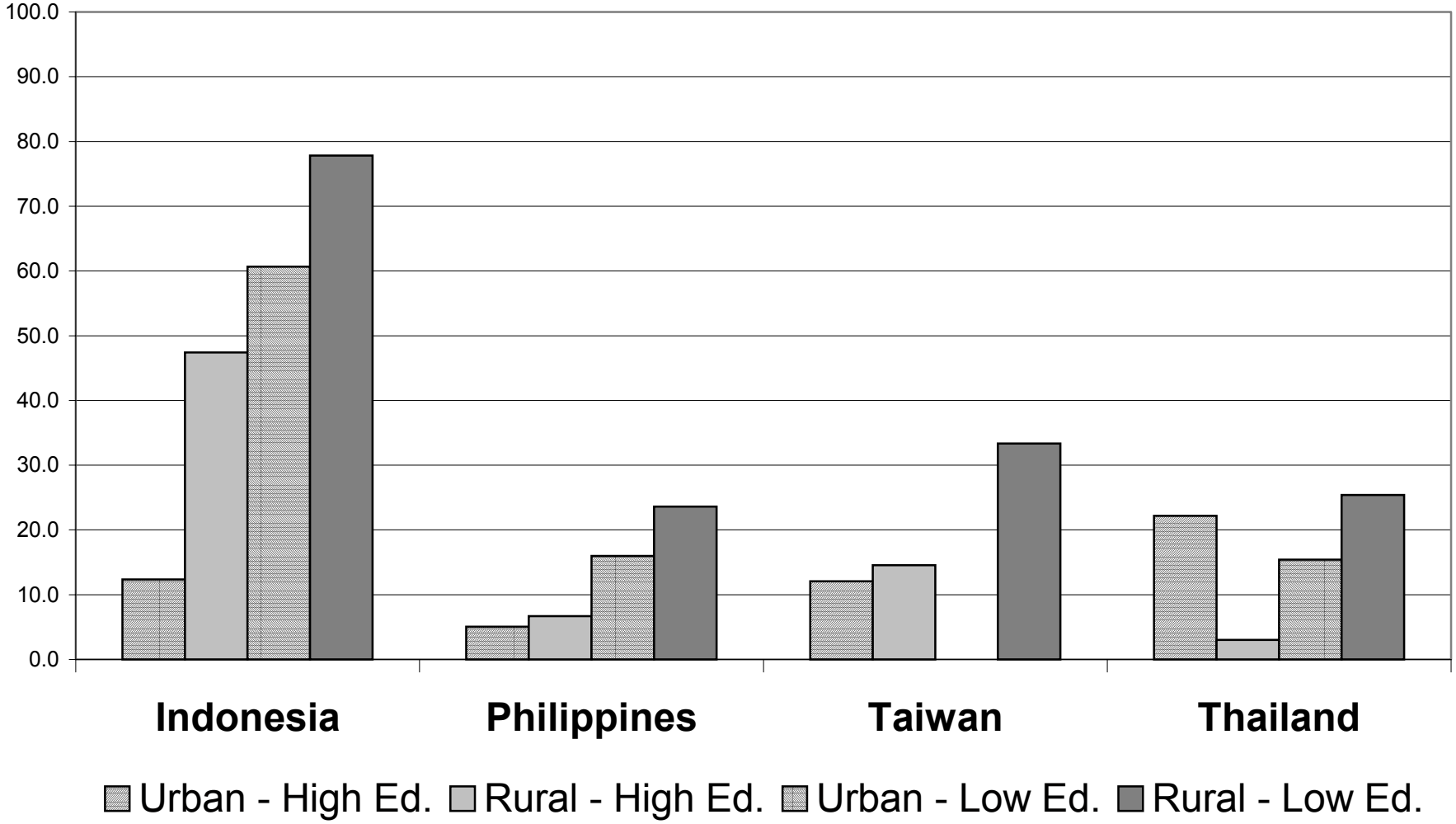

Figure 2. Percentage of Females 20-24 Sexually Active by Age 20

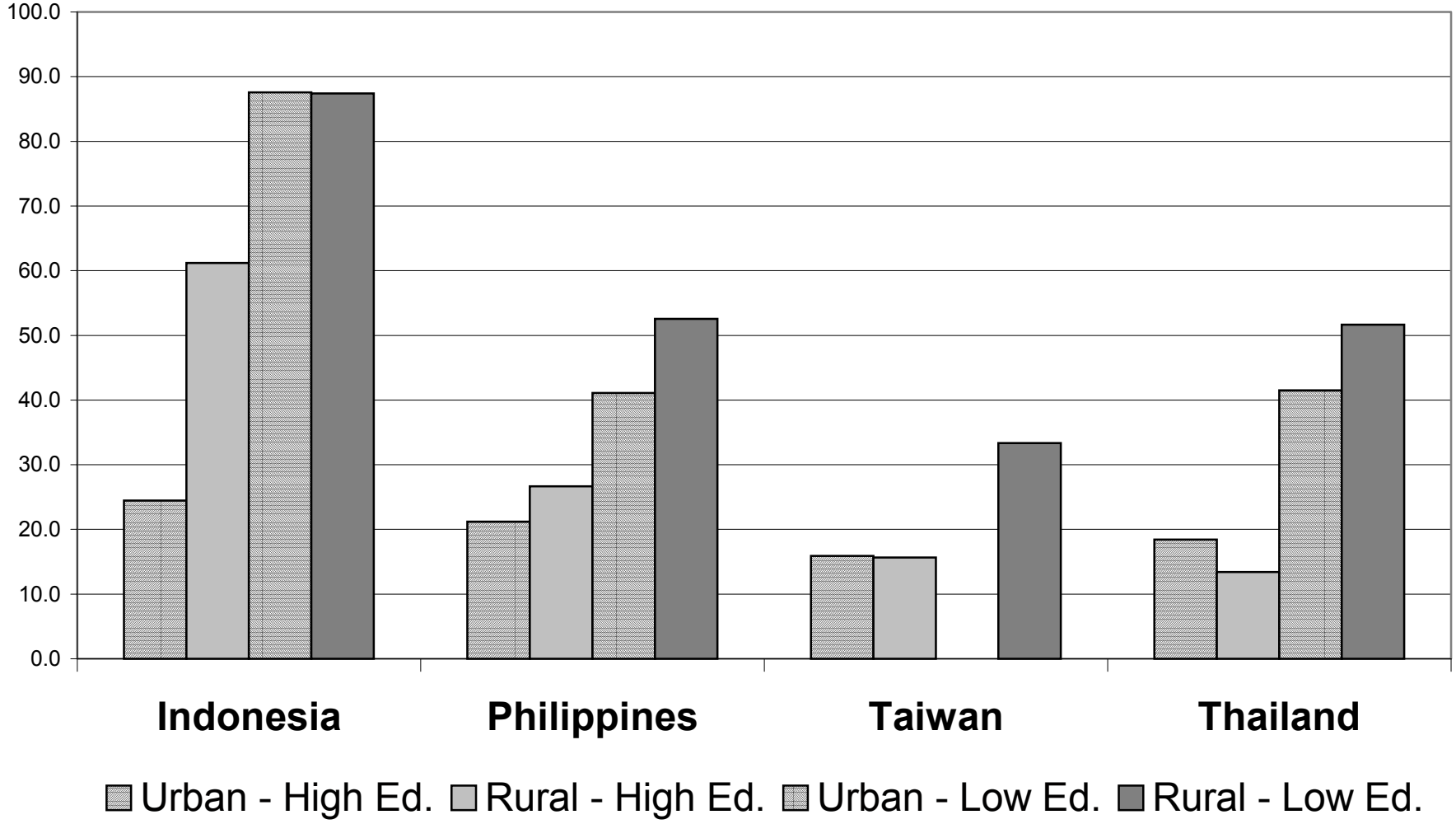

Figure 3. Percentage of Males 20-24 Sexually Active by Age 20

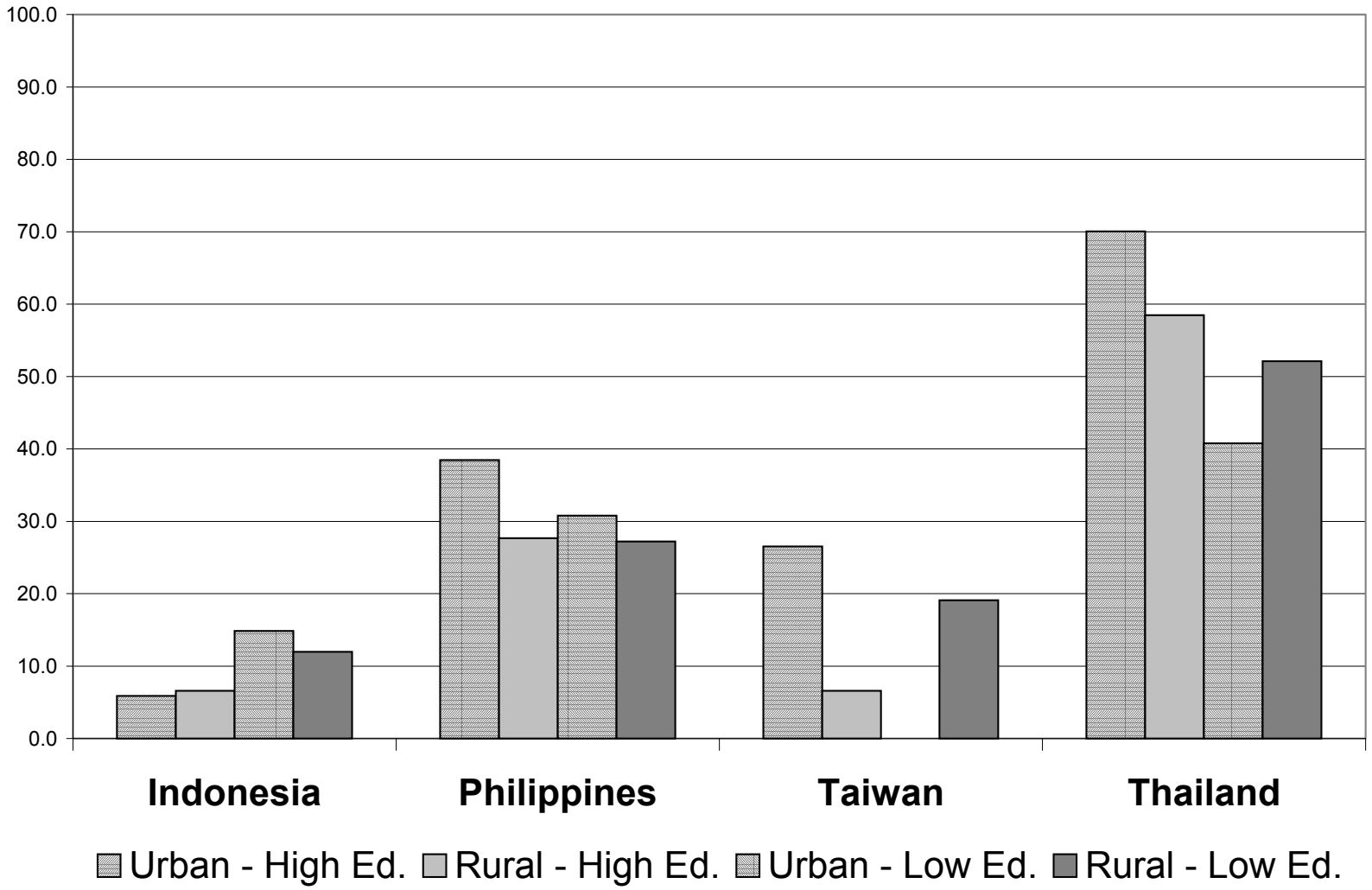

Figure 4. The Percentage of Males 20-24 Sexually Active by Age 20, by the Percentage Females 20-24 Sexually Active by Age 20, Emphasizing Country Comparisons, Residential and Educational Groups in Four Countries of Asia

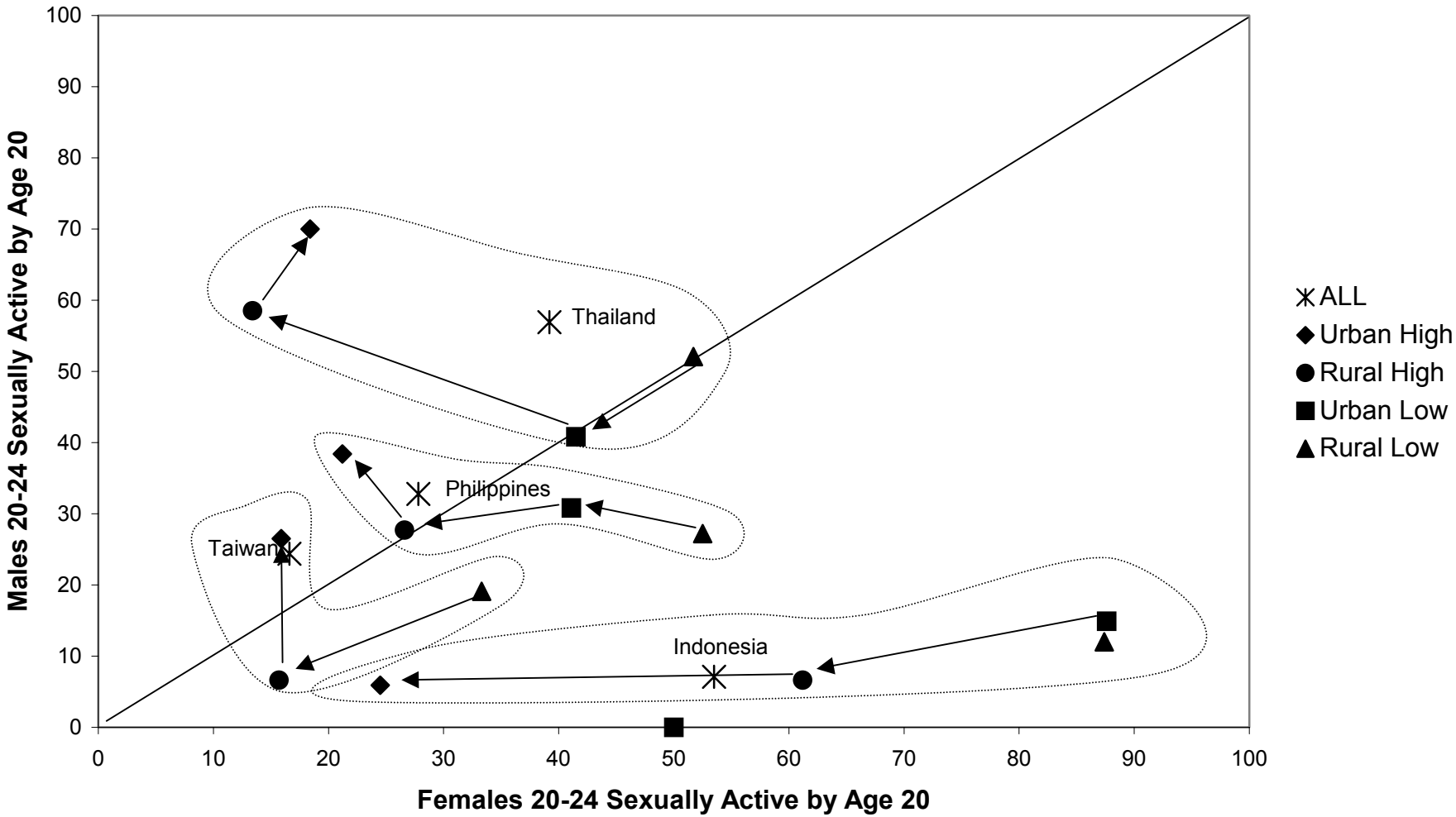
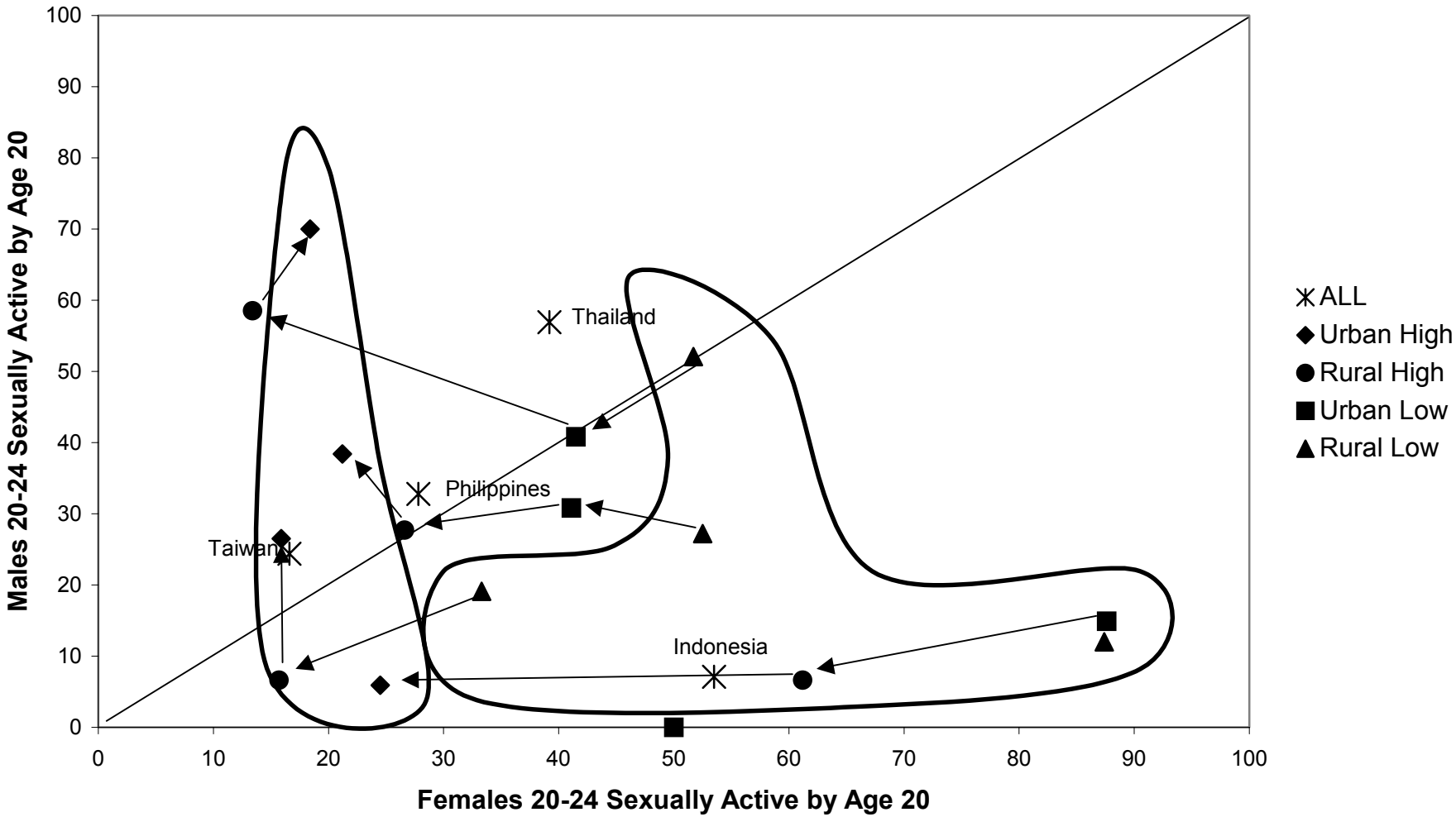
Figure 5. The Percentage of Males 20-24 Sexually Active by Age 20, by the Percentage Females 20-24 Sexually Active by Age 20, Emphasizing Sub-Group Comparisons, Residential and Educational Groups in Four Countries of Asia