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AIDS in Asia and the Pacific

*by Stephen G. Karel
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SINCE THE FIRST cases of AIDS—acquired immune deficiency syndrome—were diagnosed in 1981, concern has been spreading as the number of AIDS-related deaths has grown. As of 30 June 1988 the World Health Organization (WHO) had received reports of 108,176 cases of AIDS from 177 countries. About 73 percent of the cases were from the Americas, 14 percent from Africa, 12 percent from Europe, and the remaining 1 percent from Oceania and Asia (see Table 1).

For the most part, Asia has not yet felt a major impact from AIDS. Of the 108,176 reported cases last June, only 264 were from some 19 Asian countries. These statistics are highly misleading, however, both because of underreporting and because many cases could be in the early stages of the infection and not yet diagnosed as AIDS.

"AIDS is knocking on the door of Asia," according to Dr. Halfdan Mahler, the former director general of WHO (Panos Institute 1987:60). WHO has warned Asian governments that AIDS is likely to spread rapidly throughout the region within the next five years unless health standards improve rapidly and effective public education campaigns are undertaken.

Assuming that between 5 and 10 million people worldwide have already been infected with HIV, the AIDS virus, it is likely that from 500,000 to 3 million new cases of AIDS will occur by 1991. WHO warns that if HIV infection spreads among the populations of Latin America and Asia as rapidly as it

Table 1. **Reported AIDS cases worldwide, by region: June 1988**

Region	No. of cases
Americas	78,908
Africa	14,786
Europe	13,214
Oceania	1,004
Asia	264
Total	108,176

Source: *Health & Development* July 1988:4.

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Has spread elsewhere, 50 to 100 million people worldwide could be infected by 1991 (Mann 1987:366). (See Figure 1.)

Some Asian governments do not yet appear to view AIDS as a serious national public health issue. Others have been reluctant to report AIDS cases to WHO for fear of hurting tourism (*Bangkok Post,* 28 November 1987). Many still consider AIDS to be an imported disease, the product of western sexual promiscuity.

Measures to control the spread of AIDS have focused primarily on preventing its introduction into countries by foreign travelers, students, or military personnel, and screening of high-risk groups. Asian governments generally have approached publicity about AIDS with caution, and public education efforts have been limited (*Tokyo Journal* 1987:9).

This attitude may be changing, however, as the number of AIDS cases rises and public awareness increases. For example, the permanent secretary of Thailand's Ministry of Health, Dr. Pairoj Ningsanont, recently acknowledged that an increase of AIDS carriers among drug users posed a serious health concern in his country (*Bangkok Post* 31 March 1988).

This article reports current information about AIDS and its effects, and discusses the efforts of governments and international organizations to deal with AIDS in Asia and the Pacific. Confirmed statistics on cases of AIDS and HIV infection in the Asian and Pacific region are difficult to obtain, and not all reports agree. We have attempted to use the best available data, but some numbers have been drawn from news reports and public statements in cases where official statistics were not readily available.

■ Medical overview

Acquired immune deficiency syndrome, or AIDS, is the name given to a complex of health problems caused by the human immunodeficiency virus (HIV). This virus attacks an individual's immune system and ultimately destroys its ability to ward off disease. The individual then becomes vulnerable to infections by bacteria, other viruses, and malignancies, which may cause such life-threatening illnesses as pneumonia, meningitis, and cancer.

HIV infection causes a range of debilitating symptoms, such as fevers, diarrhea, and swollen lymph nodes. Other symptoms include weight loss, night sweats, and exhaustion. Neurological problems such as dementia may also result from HIV infection. Individuals infected with HIV who show less severe symptoms of AIDS are considered to have AIDS-related complex (ARC).

HIV has been isolated from blood, semen, vaginal secretions, saliva, tears, breast milk, and urine and is likely to be present in other body fluids, secretions, and excretions (Mann 1987:363). However, epidemiological evidence has implicated mainly blood, semen, and vaginal secretions in transmission.

As the etiological agent of AIDS, HIV is transmitted in the following ways:

• through intimate sexual contact with an infected individual,

• through exposure to contaminated blood and blood products;

• from an infected mother to her child before, during, or shortly after birth;

• by means of infected body organs, other tissues, or semen from an infected donor.

Sexual contact has been the main mode of HIV transmission worldwide. Sexual contact between homosexual men has been a leading form of transmission in the United States and Europe. Infected men can infect their female sex partners as well, and infected women can similarly infect men. Transmission occurs through vaginal, oral, and anal intercourse, although the relative efficiency of each route is not known.

An infected individual does not need to display symptoms to spread the infection (Mann 1987:364). The risk of HIV infection is increased by having multiple sex partners, either homosexual or heterosexual. However, the specific type of sexual activity, and the prevalence of HIV in the sex partner, may be even more important determinants of the spread of the virus.

Transmission of HIV infection through exposure to blood and blood products occurs as a result of the transfusion of infected blood or blood products, the use of blood-contaminated needles or equipment by drug abusers, or the use of inadequately sterilized needles or other skin-piercing instruments. HIV is *not* spread through immunization programs using properly sterilized syringes (Mann 1987:364), nor can the virus be transmitted by donating blood as long as a sterile needle is used.

If a woman infected with HIV becomes pregnant, there appears to be about a 50 percent chance that her child will also become infected with HIV. Breastfeeding has been implicated in the after-birth trans-
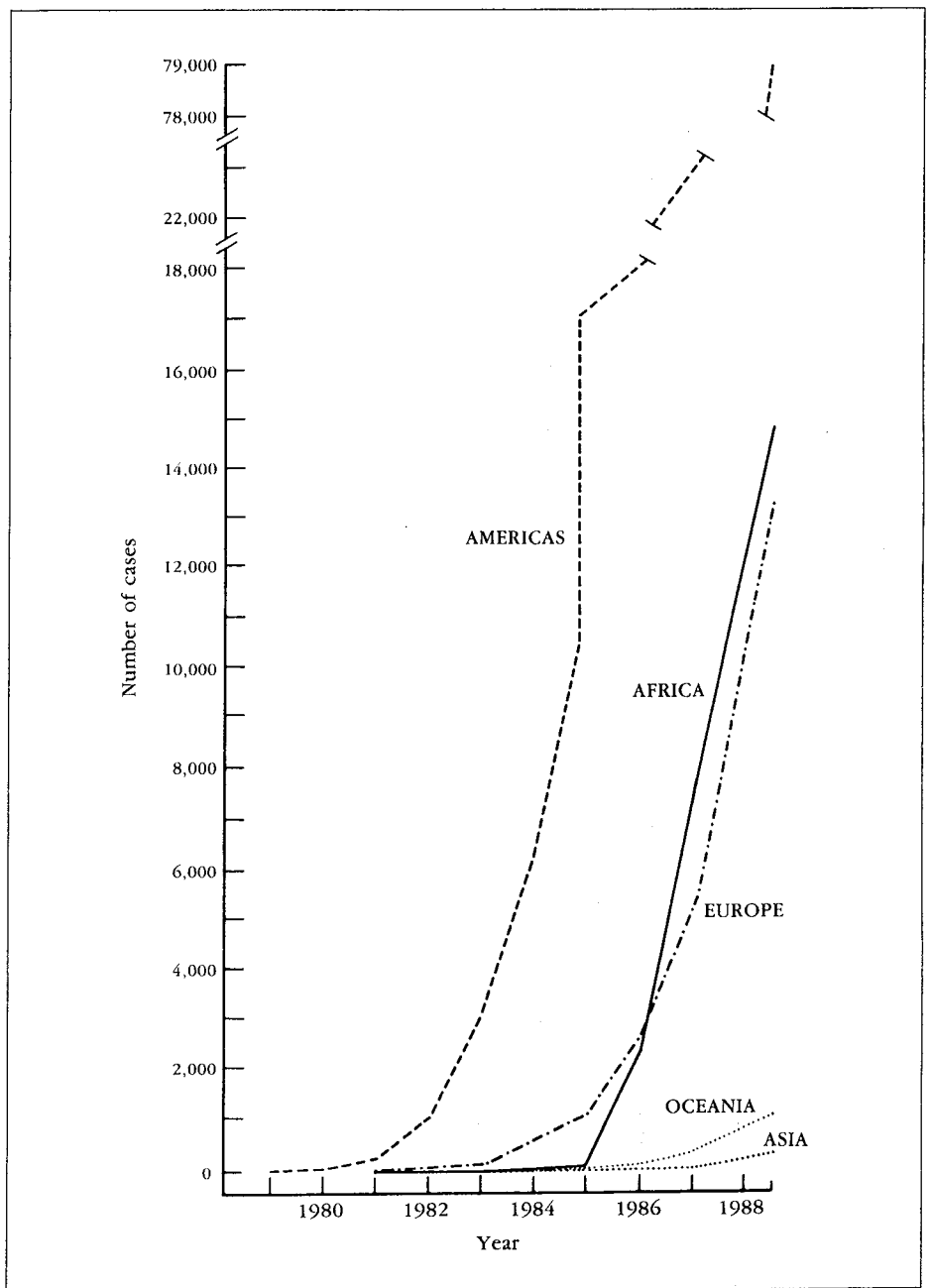

Figure 1. **AIDS cases reported to WHO, by region: 1979 to June 1988**

Source: Health & Development July 1988:4.

mission of HIV in several cases, but other instances have been reported of infected mothers who breastfed their infants and did not transmit HIV to them (Lifson 1988:1353).

Because of the possibility of post-natal transmission to a child who may not yet be infected, the U.S. Public Health Service currently rec-ommends that known HIV-infected women avoid breastfeeding (Lifson 1988:1353). This recommendation may not be feasible in many parts of the developing world, where the HIV status of most pregnant and nursing women is unknown. Public

health officials in developing coun-tries have been encouraging breast-feeding as infants' best protection against other life-threatening infec-tions, which so often lead to infant death (Sabatier 1987a:100).

There is no evidence that the in-fection is transmitted by so-called casual contact—that is, contact that can be even quite close between persons in the course of daily ac-tivities. It is extremely unlikely that HIV can be transmitted by insect bites, sneezing, shaking hands, shar-ing a drinking glass, or living in the same household with an AIDS

sufferer or an HIV-infected person.

The period between infection with HIV and the onset of AIDS symptoms seems to range from six months to ten years or more. Some estimates put the median period as high as eight years. This long and often unrecognized period of asymptomatic infection, during which an infected person can infect others, complicates the task of deal-ing with the spread of the virus.

The risk of progressing from HIV infection to the development of AIDS appears to increase with time; that is, the risk during the third year of infection is greater than the risk during the first year. Within five years of being infected with HIV, 10 to 30 percent of people de-velop AIDS, and another 25 to 30 percent develop ARC (Figure 2). To date, some 30 percent of ARC pa-tients have gone on to develop AIDS (Rowe and Ryan 1987:1-2). Experts estimate that within ten years after being infected by HIV, a majority (and perhaps all) of these people will develop AIDS. Those who do not are likely to develop ARC (Mann 1987:363).

AIDS is fatal to nearly all of its victims. Of all AIDS cases reported to the health authorities in the United States and Western Europe, 50 percent have since died. For AIDS cases diagnosed in the United States three years ago, the case fatal-ity rate is above 75 percent. Among those diagnosed before 1982, the case fatality rate is 90 percent (WHO 1986:A-6). It could be even higher, for many cases are lost in follow-up.

The most common cause of death from AIDS in the United States is *Pneumocystis carinii* pneumonia, a
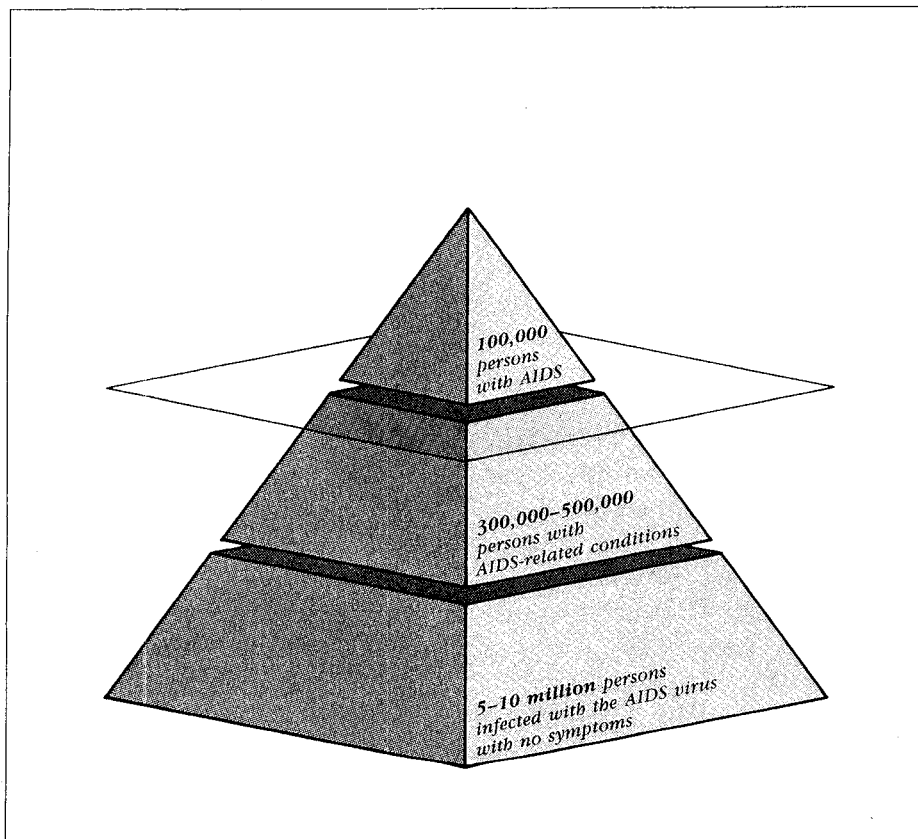

Figure 2. **The deadly AIDS pyramid: Estimated cases of HIV infec-tion as of April 1987**

Source: World Health Organization, Global Programme on AIDS.

Strength of Fertility Motivation and Contraceptive Use in Nepal

by Robert D. Retherford,
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Nepal's 1986 Fertility and Family Planning Survey included questions intended to measure the strength of respondents' fertility motivations. The responses can be used for improved prediction of current contraceptive use, over and above the effects of other causal variables typically included in studies of the determinants of contraceptive use. Controlling selected demographic and socioeconomic background characteristics of the respondents, the authors of the following article found the effect of the strength of fertility motivation on current contraceptive use to be substantial and highly statistically significant.

Nevertheless, the background factors largely captured the effect of motivational strength on current use when motivational strength was deleted from the model, inasmuch as measures of global fit declined only slightly as a consequence of the deletion.

These findings indicate that respondents' demographic and socioeconomic background characteristics affect motivational strength, so that motivational strength does not have a large independent effect on use.

ALREADY A DECADE AGO, Westoff and Ryder (1977) showed that the predictive validity of reproductive intentions could be enhanced by supplementing survey questions on desired family size with questions designed to assess the degree of certainty with which respondents intended to have or not to have another child. Despite this earlier work, questions on strength of fertility motivation have been slow to make their way into major fertility survey questionnaires.

The World Fertility Surveys, for example, did not include any questions on strength of fertility motivation. Nor did the Contraceptive Prevalence Surveys. The ongoing round of Demographic and Health Surveys includes questions on strength of fertility motivation, but to our knowledge these data have not yet been analyzed.

The importance of measuring strength of fertility motivation has been noted by Cleland (1986:5): "Variations in the intensity of the desire to avoid childbearing might also explain why couples in different socioeconomic strata who desire the same number of children differ widely in their use of contraceptives. Few recent surveys have attempted to address this issue, which is of both practical and theoretical importance." Others have also emphasized the potential use-

fulness of detailed data on family planning motivation and attitudinal intensity (e.g., Fishbein and Jaccard 1973; Fishbein 1974; Retherford and Palmore 1983; Retherford 1985).

In this article, we test whether new survey questions on strength of fertility motivation, included in Nepal's 1986 Fertility and Family Planning Survey, enable improved prediction of current contraceptive use and of intention to use contraception in the future, over and above the effects of socioeconomic background factors.

■ Data and methodology
The 1986 Nepal Fertility and Family Planing Survey (NFFS) is the most recent nationally representative sample survey in Nepal, collecting information from women on their maternity histories, contraceptive knowledge and use, fertility motivation, and both their and their husbands' demographic and socioeconomic background characteristics. Designed to elicit information useful for family planning program evaluation, it is a follow-up to the 1976 Nepal Fertility Survey and the 1981 Nepal Contraceptive Prevalence Survey.

The NFFS sample included currently married women 15–50 years of age. The sample was drawn separately for urban and rural areas, and urban areas were oversampled. A total of 1,255 urban women and

3,774 rural women were successfully interviewed. Response rates were 95.8 percent for urban and 98.3 percent for rural women. Details of sample design are contained in the survey report (Nepal Family Planning and Maternal and Child Health Project 1987).

The dependent variables in our analysis of the NFFS data are, alternatively, current use of contraception (coded as 1 if a respondent was using any method, 0 otherwise) and intention to use contraception in the future (coded as 1 if a respondent intended to use it in the future, 0 otherwise). The "current use" variable is based on an NFFS question that covers both modern and traditional methods of contraception. The "intention to use" variable is based on a question that asked the respondent whether she or her husband had thought of using any family planning method in the future.

The analysis of current use excludes sterilized and otherwise nonfecund women, who were not asked the questions on the strength of their fertility motivation.[1] The analysis of intention to use excludes not only nonfecund women but also all current users of any method of contraception.

The principal independent variable in our analysis is strength of fertility motivation. This variable,

1. The exclusion of sterilized women from the analysis of current use involves some selection of the sample on the basis of the dependent variable, current use. The effects of strength of fertility motivation are probably biased downward as a result. To estimate the magnitude of this bias, we did a test run that included sterilized women with imputed RPI values of −3 in the analysis and found that the effects of RPI on both current use and intention to use were much larger than those reported here.

which we call relative preference intensity (RPI), is a seven-point scale based on two questions included to assess how strongly respondents felt about having or not having another child. The two questions were asked only of fecund women, i.e., women who thought it was physically possible for them to have another child, as far as they knew.[1]

Women who answered "yes" to the question, "Do you want to have any/another child sometime?" (apart from current pregnancy, if any) were then asked, "Would you say that your desire to have children/more children is not very strong, strong, or very strong?" Women who answered "no" to the first question were asked, "Would you say that your desire not to have any more children is very strong, strong, or not very strong?"

Responses were coded into relative preference intensity (RPI) scores as follows:

Response	RPI score
Want another child	
Very strongly	+3
Strongly	+2
Not very strongly	+1
Undecided	0
Want no more children	
Not very strongly	−1
Strongly	−2
Very strongly	−3

We have used the RPI scores first to construct family-size preference profiles, which are plots of cumulative RPI values by number of living children. (A current pregnancy is counted as a living child.) These profiles are synthetic, because family-size preference profiles cannot be constructed for individual

women using the NFFS data. For a particular woman, RPI is specific to the number of children she had at the time of the survey. For example, if she had three children, her RPI value tells us how strongly she wanted or did not want a fourth child. We do not know how strongly she wanted another child at earlier times in her life when she had, say, one or two children.

Synthetic family-size preference profiles may be calculated by chaining together average RPI values for women of each possible number of living children, as shown in Figures 1–3, so that in each preference profile, the quantity plotted on the vertical axis is the cumulative relative preference intensity (CRPI). To calculate CRPI, one first calculates a mean value of RPI for women of each number of living children. The value of CRPI for zero living children is arbitrarily set at zero. (Because the values of RPI are relative, the starting point of CRPI is arbitrary.)

CRPI(1) is simply RPI(0); i.e., cumulative relative preference intensity for one child equals the mean RPI score for women with no living children. CRPI(2) = RPI(0) + RPI(1), and in general CRPI(i) = $\Sigma_{x<i}$ RPI(x). The preference profiles peak at values close to mean desired number of children. The coincidence is not exact, however, because the peaks in the profiles are constrained to integer values. The CRPI profiles have some additional analytical limitations that will be discussed later.

We also analyze in a multivariate mode the determinants of contraceptive use and of intention to use contraception in the future, with RPI as only one of several ex-

planatory variables. The multivariate analysis includes additional demographic and socioeconomic control variables because we wish to know whether RPI contributes to explanation over and above the effects of demographic and socioeconomic variables usually included in analyses of the determinants of contraceptive use (see, for example, Cleland et al. 1979).

The additional variables we include are number of living children, age at first marriage, urban residence, woman's education, and an amenities index. Age of mother, which is often included in analyses of the determinants of contraceptive use, is omitted in our analysis because of its collinearity with number of living children. Husband's education is likewise omitted because of its collinearity with woman's education. Our amenities index is a four-point scale variable obtained by adding responses to three items: drinking water (1 if the household used a tap or tube well, 0 otherwise), latrine (1 if the household had a latrine, 0 otherwise), and electricity (1 if the household had electricity, 0 otherwise). We use the amenities index instead of three separate items because of multicollinearity among the three items.

Because our dependent variables, current use of contraception or intention to use contraception in the future, are binary variables, we use logit regression as our method of multivariate analysis.

■ Results of family-size preference profiles

The range of variation in mean desired number of children by socioeconomic category in the NFFS

is rather small, between three and four children (Table 1). The family-size preference profiles in Figures 1–3, however, show more variation than is immediately apparent from the values of mean desired number of children in Table 1.

For example, Table 1 shows that mean desired number of children is 3.4 for urban women and 3.9 for rural, but Figure 1 shows additionally that the shapes of the two profiles are markedly different, with the peak for urban considerably flatter than the peak for rural. (The urban curve is truncated at 5 living children, because RPI(5) is based on fewer than 15 women, the number we somewhat arbitrarily chose as a cutoff value.)

The shape of the urban curve in Figure 1 is of considerable interest.

Table 1. **Mean desired number of children, by selected socioeconomic characteristics, for women reporting relative preference intensity (RPI): Nepal 1986 Fertility and Family Planning Survey**

Characteristic	Mean desired number of children	
	Urban	Rural
Residence		
Urban	3.4 (484)	na
Rural	na	3.9 (1,598)
Region		
Mountain	na	3.7 (128)
Hill	3.1 (231)	3.9 (732)
Terai	3.8 (262)	3.9 (739)
Woman's education		
No schooling	3.7 (317)	3.9 (1,472)
Some schooling	2.9 (167)	3.6 (126)
Husband's education		
No schooling	4.0 (152)	4.0 (928)
Some schooling	3.2 (338)	3.7 (663)
Drinking water		
Tap or tube well	3.2 (356)	3.7 (643)
Other	4.0 (131)	4.0 (949)
Latrine		
Yes	3.1 (249)	3.8 (112)
No	3.8 (239)	3.9 (1,486)
Electricity		
Yes	3.1 (279)	3.5 (62)
No	3.9 (209)	3.9 (1,535)
Total	3.4 (493)	3.9 (1,599)

Note: Sample numbers are shown in parentheses. Total sample numbers for characteristics may differ because of variability in nonresponse.

na—not applicable.

It suggests that the potential for family planning adoption in urban areas is rather limited, because women, on average at least, are almost indifferent to the alternatives of three, four, and five children. For such women, birth control costs do not have to be very high to discourage those with three children from stopping at three. They are likely to go on to have at least two more children, even if they express a preference for three.

As has been elaborated elsewhere (Retherford 1985), the shape of the CRPI curve in the neighborhood of its peak conveys considerable information about the potential for family planning adoption in a population. That potential would seem to be especially great in populations where the preference profile peaks at a low number of surviving children and falls off rapidly after the peak. By this criterion, the preference profiles in Figures 1–3 suggest

that women with some education and modern amenities living in urban areas have a higher potential than other women for adopting family planning.

Although the preference profiles are useful, they have some analytical limitations. Their calculation assumes cardinal measurement, whereas measurement is really ordinal. This means that cumulation of RPI values can be misleading. For example, although CRPI(6) is greater than CRPI(3) in the rural preference profile in Figure 1, this fact does not necessarily mean that rural women on average prefer six over three children.

A direct question (not included in the NFFS) on their preference for three compared with six children might conceivably have shown that, on average, respondents preferred three over six. Such a discrepancy could occur because of the ordinal measurement. (For further discussion of this point, see Coombs et al. 1975.)

The preference profiles must therefore be interepreted cautiously. Perhaps the greatest utility of the curves is that they permit inferences about the potential for family planning adoption drawn from examination of the slopes of the curve extending to one child on either side of the peak.

A further limitation of the preference profiles is that they are not multivariate. For our multivariate analysis of contraceptive use, we use logit regression.

Figure 1. **Cumulative relative preference intensity (CRPI) profiles, by urban–rural residence: Nepal 1986 Fertility and Family Planning Survey**

Note: Plotted points are based on at least 15 women.

■ Results of logit regression analysis

Because only women for whom RPI scores could be calculated are included in the analysis, and because

scores could not be calculated for sterilized women for whom the questions on strength of fertility motivation were not asked, the distribution of women by contraceptive use (shown in Table 2) is skewed heavily toward nonusers. Only 9.8 percent of urban women and 3.0 percent of rural women were currently using contraception, excluding sterilization. Had it been possible to include sterilized women in the analysis, these percentages would have been considerably higher, because sterilization accounts for about 85 percent of contraceptive use in Nepal (Nepal Family Planning and Maternal and Child Health Project 1987:table 10.23).

The percentage of women not currently using contraception but intending to use it was considerably higher, 37.4 percent for urban women and 23.6 percent for rural women.

Table 2 also shows that the mean number of living children was fairly low, at 1.8 for urban women and 2.1 for rural women, because most women in the sample had not yet completed their families. The combined sample was heavily rural, concentrated in the hill and terai (lowland) regions, largely uneducated, and with few modern amenities. The distribution of women by RPI score shows that 22.4 percent of urban women and 17.9 percent of rural women did not want any more children. Only 4.2 percent of urban women and 3.8 percent of rural women were undecided about having more children. Some 70.6 percent of urban women and 73.3 percent of rural women felt either strongly or very strongly that they wanted another child.

Figure 2. **Cumulative relative preference intensity (CRPI) profiles, by selected socioeconomic characteristics of urban women: Nepal 1986 Fertility and Family Planning Survey**

Note: Plotted points are based on at least 15 women.

Tables 3 and 4 show results of the logit regression analysis. In Table 3, two models are presented for each dependent variable. Models 1 and 3 exclude RPI as an independent variable, and models 2 and 4 include it. The purpose of this design is to ascertain whether RPI adds significantly to the explanation of current use or intention to use, over and above the other independent variables.

The other independent variables are as described previously, except that number of living children squared is included, as well as number of living children, to capture the relationship between number of living children and contraceptive use, which tends to be shaped like an inverted U. Woman's education is a continuous variable, number of completed years of education.

We represent the seven RPI values by six dummy variables instead of one continuous variable, because we expect the relationship to be nonlinear. If birth control is used primarily for limiting family size but not much for birth spacing, as is often the case early in the process of fertility transition and as we expect in Nepal, then there should be little or no contraceptive use when RPI is greater than or equal to zero but increasing levels of use for RPI values of −1, −2, and −3.

Instead of underlying coefficients, Table 3 presents odds ratios, which are easier to interpret. For example, the odds ratio of 0.822 for urban in model 1 for current use means that the odds of using contraception are 0.822 times as great for urban women as for rural women, when the other independent variables are held constant. Thus the odds ratio
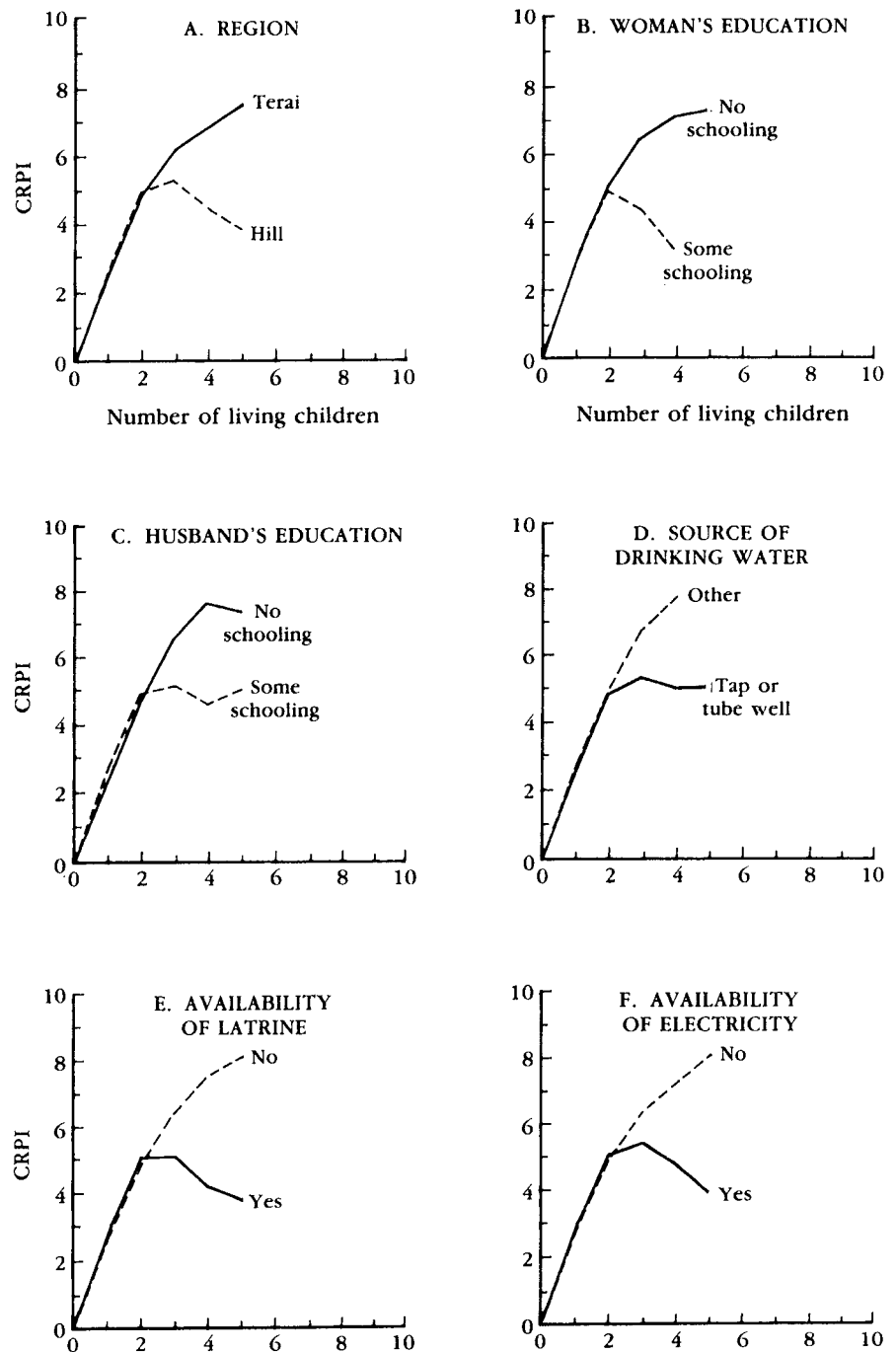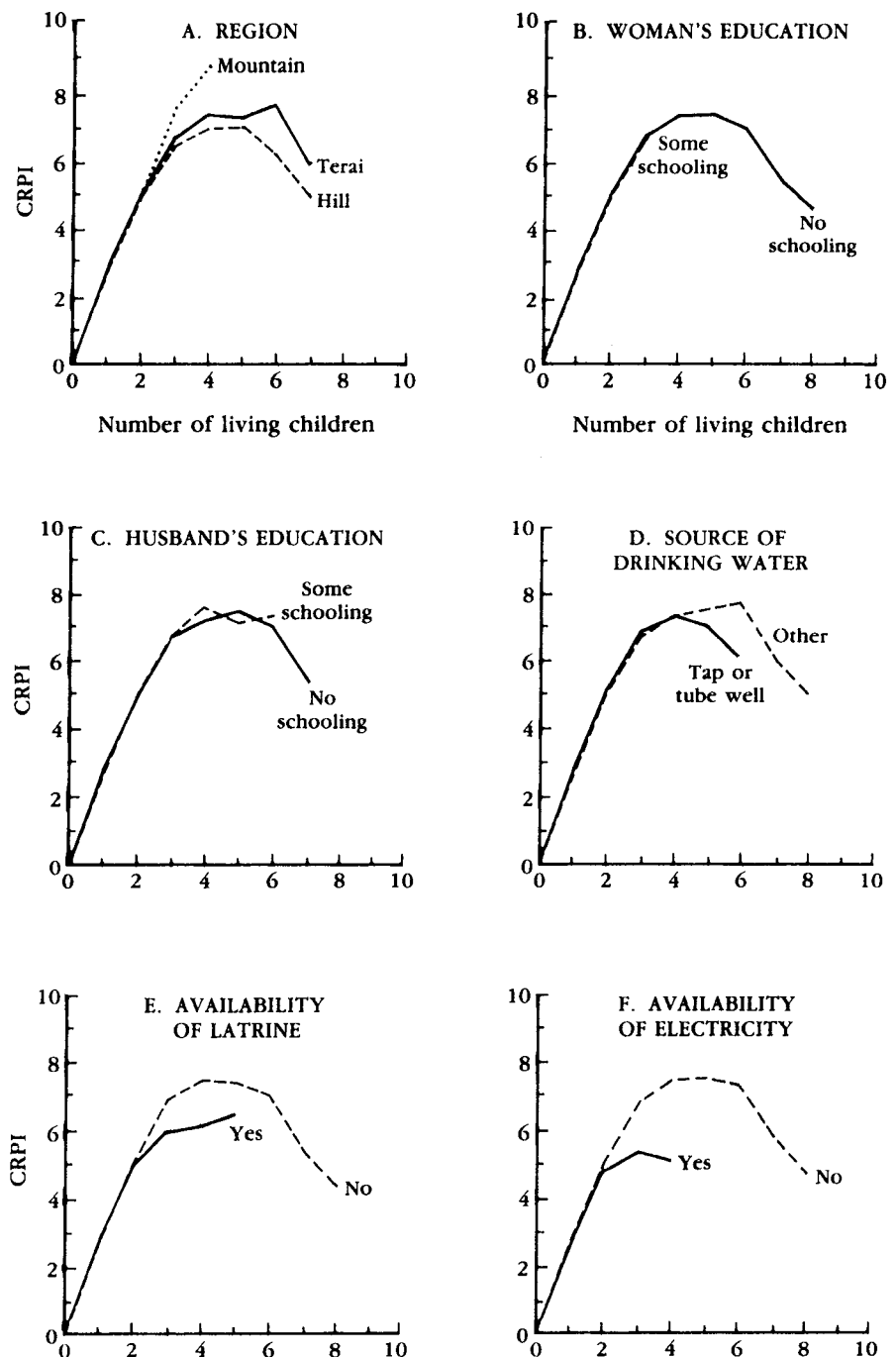

Figure 3. **Cumulative relative preference intensity (CRPI) profiles, by selected socioeconomic characteristics of rural women: Nepal 1986 Fertility and Family Planning Survey**

Note: Plotted points are based on at least 15 women.

measures the effect of being urban, relative to being rural, on the odds of using contraception. (The effect of being urban is not in the expected direction in model 1, but the effect does not differ significantly from unity.)

The odds ratio of 1.082 for age at first marriage means that the odds of using contraception are increased by a factor of 1.082 for each one-year increase in age at marriage.

The estimated effect of a one-child increase in the number of living children depends on the number of living children that a woman has, because of the squared term. For example, if the woman has one living child, the effect of a one-child increase in the number of living children is to increase the odds of using contraception by a factor of $(3.423)(0.835)^{(2)(1)} = 2.387$. If the woman has five living children, the effect of a one-child increase in the number of living children is to decrease the odds of using contraception by a factor of $(3.423)(0.835)^{(2)(5)} = 0.564$.

Quantities in parentheses following the odds ratios are prob-values. They indicate exact level of statistical significance for the logit regression coefficients from which the odds ratios are calculated as exp(B), where B is the underlying coefficient.

The findings for current use show that all variables except urban residence have highly statistically significant effects in both models 1 and 2. Such variables as woman's education and amenities evidently account for the effect of urban residence on use, shown in Table 2, using a simpler cross-tabulation mode of analysis.

In model 1, the effects of number

Table 2. **Demographic and socioeconomic characteristics of fecund women reporting relative preference intensity: Nepal 1986 Fertility and Family Planning Survey**

Characteristic	Urban	Rural
Currently using contraception (%)[a]		
Pill	4.4	1.2
Condom	2.8	1.0
Loop	1.4	0.2
Injectable	1.2	0.6
Currently not using contraception (%)	90.2	97.0
(N)	(502)	(1,622)
Intending to use contraception (%)[b]		
Yes	37.4	23.6
No	62.6	76.4
(N)	(452)	(1,574)
Mean number of living children	1.8	2.1
(N)	(500)	(1,622)
Mean age at first marriage	18.0	17.1
(N)	(499)	(1,616)
Region (%)		
Mountain	0.0	7.9
Hill	46.8	45.8
Terai	53.2	46.4
(N)	(502)	(1,622)
Woman's education (mean number of completed years)	2.8	0.4
(N)	(493)	(1,621)
Husband's education (mean number of completed years)	6.3	2.8
(N)	(499)	(1,614)
Source of drinking water (%)		
Tap or tube well	73.0	40.4
Other	27.0	59.6
(N)	(496)	(1,615)
Availability of latrine (%)		
Yes	51.1	6.9
No	48.9	93.1
(N)	(497)	(1,621)
Availability of electricity (%)		
Yes	57.3	3.9
No	42.7	96.1
(N)	(497)	(1,620)
Mean of amenities index	1.8	0.5
(N)	(496)	(1,614)
Relative preference intensity (RPI)		
Mean of RPI scale	1.25	1.50
Percent with specified RPI scale values		
−3	13.0	8.1
−2	5.4	6.0
−1	4.4	3.8
0	4.2	5.1
1	2.6	3.7
2	35.3	33.0
3	35.3	40.3
(N)	(502)	(1,622)

a. Traditional methods accounted for less than 0.5 percent of contraceptive use and are not shown. Sterilized persons, who were much more numerous, are excluded from the table.

b. Pertains only to current nonusers.

of living children, age at first marriage, and urban residence have already been discussed. Each additional completed year of education increases the odds of current use by a factor of 1.097. A one-unit increase in the amenities index increases the odds of current use by a factor of 2.120.

In model 2, with RPI additionally included among the independent variables, strongly not wanting another child, corresponding to an RPI value of −3, increases the odds of current use by a factor of 6.394, relative to the reference category of strongly wanting another child, corresponding to an RPI value of +3. As expected, the odds ratio tends to decrease, though somewhat irregularly, as RPI increases. Contrary to expectation, the odds ratios are greater than unity for RPI values of 0, 1, and 2, suggesting that some women may be using contraception for birth spacing. (At positive values of RPI, one expects virtually no contraception to be used for family limitation.) All six of the RPI effects on contraceptive use, as indicated by odds ratios, differ significantly from unity, pertaining to the reference category of RPI = 3 $(p<.04)$.

When RPI is introduced into the logit regression in model 2, the effects of all other independent variables except age at first marriage are somewhat smaller than in model 1 (i.e., the odds ratios move toward a value of unity, indicating no effect). The reduction is especially large for number of living children. The result is that R^2 (the logit regression analogue of the coefficient of deter-

Table 3. **Effects of demographic and socioeconomic variables on the odds of currently using contraception and the odds of intending to use contraception in the future: logit regression model estimates of odds ratios, Nepal 1986 Fertility and Family Planning Survey**

Characteristic	Dependent variable							
	Currently using				Intending to use			
	Model 1		Model 2		Model 3		Model 4	
Number of living children	3.423	(.000)	1.981	(.023)	1.173	(.068)	1.248	(.019)
Number of living children squared	0.835	(.000)	0.878	(.012)	0.975	(.082)	0.971	(.059)
Age at first marriage	1.082	(.007)	1.086	(.006)	1.005	(.748)	1.004	(.801)
Urban residence	0.822	(.558)	0.793	(.504)	0.990	(.948)	1.009	(.954)
Woman's education	1.097	(.002)	1.075	(.022)	1.081	(.000)	1.083	(.000)
Amenities	2.120	(.000)	2.004	(.000)	1.334	(.000)	1.331	(.000)
Relative preference intensity								
−3			6.394	(.000)			.841	(.406)
−2			6.976	(.000)			.937	(.788)
−1			3.423	(.035)			.491	(.026)
0			3.551	(.026)			.220	(.000)
1			4.287	(.009)			.935	(.816)
2			2.187	(.031)			.953	(.700)
3			1.000				1.000	
R^2	0.154		0.172		0.029		0.035	
−2 log likelihood	647		621		2299		2272	
Degrees of freedom	6		12		6		12	

Note: Sterilized women are excluded from the logit regressions of current use. Prob-values (i.e., exact significance levels) are shown in parentheses after odds ratios. (The prob-values actually pertain to the logit regression coefficients that underlie the odds ratios.) The R^2 statistic is somewhat similar to R^2 in ordinary least squares multiple regression, but it is calculated quite differently and it cannot be used in tests of significance like an ordinary R^2 (Harrell 1983). The logit regressions of current use are based on all fecund women who reported relative preference intensity. The logit regressions of intent to use are based on all fecund women who reported relative preference intensity and who were not currently using any method of contraception.

Reviews

Thailand's Reproductive Revolution: Rapid Fertility Decline in a Third-World Setting by John Knodel, Aphichat Chamratrithirong, and Nibhon Debavalya. Madison: The University of Wisconsin Press, 1987. ISBN 0–299-11050–8 (cloth), ISBN 0–299–11054–0 (paper). xiii, 251 pp. US $45.00 (cloth), $19.95 (paper). Available from The University of Wisconsin Press, 114 N. Murray Street, Madison, WI 53715, U.S.A.

In the last 25 years Thailand has undergone one of the most rapid fertility transitions ever recorded. The total fertility rate dropped from 6.4 children per woman during the first half of the 1960s to less than 3.0 in 1985. About two-thirds of currently married Thai women 15–44 years of age are using contraception, a level that approaches contraceptive prevalence rates in more developed countries. A two-child family is now preferred by a majority of married couples in Thailand, and very few couples want more than three children.

The transformation in reproductive attitudes and behavior has been so rapid and wide-ranging that the authors of this volume have decided to label it "a reproductive revolution." This revolution is all the more remarkable because it has taken place in a Third World country that is still overwhelmingly rural and predominantly agrarian.

Although a rise in the average age at marriage has contributed to Thailand's fertility decline, the most important proximate determinant has been the use of contraception by married couples. After presenting a comprehensive picture of the nature and extent of Thailand's fertility decline, the authors of *Thailand's Reproductive Revolution* explore the factors responsible for the easy acceptance of family planning and the rapid reduction in marital fertility, seeking answers to the following questions.

Is Thailand's reproductive revolution due to fundamental social and economic changes that have increased the cost of raising children while decreasing some of the benefits? Or is it a function of Thailand's cultural setting, which provides women with substantial autonomy and makes couples largely responsible for their own reproductive decisions (free of the dictates of parents, kin, or religion)? Could it be a result of the latent demand for fertility control that was present among a substantial proportion of couples long before the fertility transition started? And what has been the role of organized family planning programs in Thailand, which have shown an unusual willingness to incorporate new contraceptive methods and to use innovative distribution systems?

As the authors of this volume ably demonstrate, these four factors worked together and reinforced each other in producing the rapid fertility transition.

One unique contribution of this book is a careful melding of quantitative and qualitative research methods. The authors call their approach "demographically informed qualitative research." They make extensive use of focus-group interviewing, a technique often used for marketing research but rarely adapted to social science research.

Although the book is primarily a case study of Thailand's fertility decline, the authors begin by putting Thailand's reproductive revolution in the context of fertility change throughout the Third World. The text is also peppered with references to the experience of other Third World countries and the historical experience of the demographic transition in Europe. In the final chapter, the authors return to the wider world context by exploring the extent to which Thailand's reproductive revolution contains lessons for family planning programs in other Third world countries.

This comprehensive volume deals with nearly every aspect of Thailand's fertility transformation. The only oversight is an inexplicable lack of discussion about the relationship between migration and fertility and the relevant research on that topic. Overall, the book is nothing less than what we would expect from three of the foremost analysts of Thailand's demographic situation.

—Fred Arnold

Management Information Systems and Microcomputers in Primary Health Care edited by Ronald G. Wilson, Barbara E. Echols, John H. Bryant, and Alexandre Abrantes. Geneva: Aga Khan Foundation, 1988. Paper, 176 pp. Available from: The Aga Khan Foundation, P.O. Box 435, 1211 Geneva 6, Switzerland.

This report summarizes discussions and recommendations of experts in the design and implementation of management information systems for primary health care who attended an international workshop organized and supported by the Aga Khan Foundation, the Aga Khan University, and the National School of Public Health, Ministry of Health, Portugal. Participants represented organizations and projects in Asia, Europe, North America, and Africa.

The report provides an overview of the problems facing management information systems for primary health care. Inadequate information support is cited as a major constraint to improving efficiency in the management of scarce resources for primary health care (PHC) programs. This problem, however, is not due to a lack of data. On the contrary, the World Health Organization estimates that PHC workers, who form the base of any PHC information system, spend an average of 40 percent of their working time collecting data and filling in forms.

These vast amounts of data, which are usually passed to the provincial or national level for collating and analysis, tend to be unreliable, incomplete, and often of little use in decision making. Despite their efforts, PHC workers rarely receive feedback from the information they collect, and the lack of feedback compounds problems of motivation. In short, information systems for primary health care tend to be oriented toward data generation rather than information use.

Microcomputers have been introduced in many countries as an appropriate technology to alleviate some of the data-processing problems associated with information systems. Increased data accuracy, speed, storage, sophisticated analysis, and rapid feedback are considered key advantages that could facilitate decision making and stimulate improved performance throughout the entire health system.

The authors cite numerous case studies (in Bangladesh, Haiti, Kenya, Nepal, Pakistan, Thailand, and Uganda) of the impact of the introduction of microcomputers on information systems. Although microcomputers have made substantial data-processing improvements to existing systems, there remains an underlying concern as to the quality of the data upon which the systems are based.

There is consensus among the views expressed that information systems should be simple and community-based. On the basis of these criteria, the report provides general recommendations and guidelines, together with a description of a model system, for use in future development of information systems. Community-based systems are considered preferable because they allow communities to determine their own PHC needs, select priorities, and benefit directly from the information generated.

The authors emphasize the importance of addressing the following major issues during the design and implementation of an appropriate community-based information system for primary health care: discussions between information users and collectors before the system is established; agreement on what needs to be collected and by whom; reduction of data collected to an absolute minimum; adequate training of and feedback to data providers; and constant supervision of personnel involved in the system, especially at the data-collection level.

The authors conclude that, coupled with appropriate application of microcomputer technology, this type of community-based management information system can provide relevant, reliable, and practical information as a prerequisite to implementation of a rational strategy for expanding the coverage of primary health care services under present conditions of decreasing per capita resources.

—*John C. Wilson*

Recent Trends in Fertility and Mortality in Indonesia by the Panel on Indonesia, Committee on Population and Demography, Commission on Behavioral and Social Sciences and Education, National Research Council. Committee on Population and Demography, Report No. 29; Papers of the East–West Population Institute, No. 105. Honolulu: East–West Center, 1987. ISBN 0–86638–092–2. xvi, 96 pp. US $3.00. Available from East–West Center, Distribution Office, 1777 East–West Road, Honolulu, HI 96848, U.S.A.

This study presents estimates of the levels and trends of fertility and mortality for Indonesia during the past several decades, using available data sources and both traditional and recently developed demographic techniques. A general assessment of the age distribution of the Indonesian population and recent patterns of nuptiality are also presented.

The study is the work of the Panel on Indonesia, Committee on Population and Demogrpahy, of the National Research Council, consist-

ing of demographers and statisticians from various countries. The principal sources used to construct the estimates are the 1961, 1971, and 1980 censuses, the 1973 Fertility–Mortality Survey, and the 1976 Intercensal Population Survey, which included the Indonesian Fertility Survey in Java and Bali.

Because of such data limitations as the absence of a complete or nationally representative vital registration system in Indonesia, the exact measurement of child, infant, and adult mortality is not possible. Nevertheless, by applying indirect estimation techniques to available data, the panel members were able to estimate mortality levels.

Two principal fertility estimation methods, used with initial tabulations from the 1980 census, are the Cho–Graybill "own-children" procedure and adjusted reverse survival, both of which involve the backward projection of numbers of mothers and children within households to the time of each birth and aggregating them over households, taking into account necessary adjustments and imputation rules.

To compensate for underenumeration of children under age 1, the data are grouped into broader age groups. As a result, the fertility estimates are centered on a period several years prior to the data collection date.

The authors report that child mortality declined substantially during the late 1960s and early 1970s, especially in Jakarta and Sumatra, but remained at fairly high levels (about 160 deaths per thousand). By the mid-1970s life expectancy was about 50 years, slightly higher for females and slightly lower for males.

The 1976 Intercensal Population Survey found age at marriage for women still to be fairly early (nationally, half of all women between ages 20 and 24 were married at age 18.3), but a strong upward trend is evident in most urban areas, where median age at first marriage exceeds 20.

The total fertility rate was about 5.5 children per woman in 1967–70, but by the late 1970s it had fallen to about 4.8. Most of the decline is attributed to a substantial and rapid increase in the use of modern contraception, especially in East Java and Bali. The government's family planning program has been the principal source of contraceptive supplies and services.

The report contains a detailed summary of its findings, which are illustrated with numerous tables and graphs.

—Alice D. Harris
and Sandra E. Ward

The Economics of Mass Migration in the Twentieth Century edited by Sidney Klein. New York: Paragon House Publishers, 1987. ISBN 0-88702-213-8 (paper). 179 pp., US $10.95. Available from Paragon House Publishers, 2 Hammarskjold Plaza, New York, NY 10017, U.S.A.

The five papers in this book seek to develop a cost/benefit model for assessing the effects of twentieth-century mass migration on sending and receiving countries. Economists representing a wide variety of institutions and points of view first presented the papers at a conference on The Economic Consequences of Mass Migration, sponsored by the Washington Institute for Values in Public Policy and held in Washington, D.C., in 1985.

In the first paper, "Benefits and Costs of Migration," Edwin P. Reubens provides an analytical framework for discussing the economic issues involved. He constructs taxonomies of economic benefits and costs for both sending and receiving countries, noting in particular the U.S. experience. Topics covered include the volume of immigration, modes of entry and types of immigrants, skilled versus unskilled workers, and the capacity of a country to absorb foreign workers. With only minor modifications to fit individual national economies, his taxonomies have worldwide applications.

Each of the next four papers has a narrower geographic focus.

In the paper "Koreans in America: Recent Migration from South Korea to the United States," Paul W. Kuznets analyzes the reasons for Korean emigration and its economic effects on South Korea.

The third paper, "Indian Emigration: Its Dimension and Impact on Indian Economy" by M. C. Madhaven, focuses on a country that has one-third the land area of the United States but a population over three times as great. Although only 200,000 Indian immigrants were living in the United States in 1985, this number is expected to rise during the next decades. Madhaven examines the dimensions of Indian emigration worldwide, its causes, and its impact on the Indian economy.

The paper "Economic Impact of European Migration to Latin America after World War II" by Norman Plotkins analyzes Spanish, Italian, Portuguese, and other European migrations to Argentina, Brazil, Venezuela, and other Latin Ameri-

can countries. Plotkins contrasts pre- and post-World War II migrations and employs the economic criteria described in Reubens's paper to evaluate the economic consequences of the migrations.

The last paper, by John Walker, deals with the migration experiences of New Zealand and Australia. Despite the similarities between the immigration policies of those two nations and those of the United States, there are major differences: the remote location of the two "down-under" nations and their consequent greater control over immigration, their recent interest in stimulating migration for defense as well as for economic purposes, and the techniques of migration control practiced in Australia and New Zealand.

According to editor Klein, these papers "deal with the tip of an iceberg which is rapidly becoming more visible to the world." As large numbers of people react to all sorts of "pulls" and "pushes," it will be important for nations to know in advance what the economic costs and benefits of those migrations are likely to be. This book provides insight on the subject. The authors have dealt with a great deal of material with a welcome clarity and brevity. Tables, bibliographic references, and an index supplement the text.

The volume is a worthwhile addition to academic, economic, and population libraries.

               —*Alice D. Harris*

Input–Output Tables of China, 1981 by Centre of Economic Forecasting, State Planning Commission of China, and Department of Statistics on Balances of National Economy, State Statistical Bureau. Beijing: China Statistical Information and Consultancy Service Centre; Honolulu: East–West Population Institute, East–West Center, 1987. ISBN 0–86638–104–X (paper). iv, 107 pp. US $14.95. Available from: University of Hawaii Press, 2840 Kolowalu Street, Honolulu, HI 96822, U.S.A.

Western understanding of intersectoral economic transactions in China has long been impeded by the unavailability of input–output tables for the country. An input–output table depicts an economy as a system of interdependent producing and consuming sectors. Several Chinese input–output tables were compiled in the past, but their use was largely restricted to economic and statistical organizations within China.

The publication of *Input–Output Tables of China, 1981* makes these important economic data available in English for the first time. The tables disaggregate the Chinese economy into 24 material or product sectors, and into six broad economic classifications including agriculture; heavy industry; light industry; construction; transport, mail, and telecommunications; and commerce. The data are presented according to two methods of analysis, the industry method and the commodity method.

In the industry method "the entire output of an enterprise is classified into the industry of which predominant products of the enterprise belong." For example, the value of machinery produced by a metallurgical enterprise is included in the industry of metallurgy. Such treatment is consistent with China's economic management system and reflects the technological and economic relationships among the many sectors of the nation's economy.

In the commodity method of analysis products are classified as "homogeneous with respect to economic usage, technology, or structure of intermediate consumption." The authors suggest that, although the commodity method of analysis is useful in some circles, it is not consistent with the way in which statistics for commodity production are collected in China.

The book is divided into three parts: an introduction, 10 summary national input–output tables, and the entire body of national input–output tables. The introduction provides a useful description of the methods by which the tables were compiled and interpretations and uses of the data. The authors frankly admit that input–output analysis in China is still in an early stage. The aggregated data presented in the summary tables permit quick and broad economic interpretations. The detailed tables, however, are the most useful for economic research and interpretation of the interrelationships among the various sectors of the Chinese economy.

For example, the flow or transactions table includes an intermediate quadrant, a final products or demand quadrant, and a primary inputs quadrant. The intermediate quadrant (24 × 24 sector) contains the industries that produce goods and services in China and thus represents the economic interdependence among the producing sectors of the economy. Because the data are expressed in producers' prices, each cell in the intermediate quad-

rant represents a free-on-board (f.o.b.) value.

The final products section of the input–output table is important because it represents the autonomous sector—the one in which changes occur that are reflected throughout the rest of the table. Depreciation of fixed assets, personal income, and enterprise income are contained in the third quadrant—the primary inputs quadrant—which lists inputs into each intermediate sector that originate outside the production system (i.e., are not purchased from firms within the local economy).

According to the input–output table, the sum of purchases and sales, or total gross output, in China in 1981 was 904.8 billion yuan (1981 US $530.8 billion). This figure represents the total product of the society or the total value of gross output from the six major material-product sectors.

In addition to the national flow tables, Part III contains direct input coefficient tables, total requirement coefficient tables, distribution coefficient tables, and structural coefficient tables of final products—all of which are necessary for detailed economic interpretations. The authors describe several types of analysis that can be done with these tables, including analysis of major proportional relationships within the national economy, the effects of economic policy changes on the national economy, and verification of development plans and economic forecasting.

As a tool, the input–output technique is considered useful because of its ability to trace economic activities beyond direct, or apparent, impacts to their indirect implica-

tions for an economy as a whole, and also its ability to disaggregate an entire economy into numerous sectors. A drawback is its assumption of the linearity of an economy.

Although China's input–output tables depict just 24 sectors, they provide a basic understanding of the interrelationships of those sectors in China's national economy, which has expanded considerably in recent years.

—*James P. Dorian*

ALSO NOTED

Recent Literacy Trends in India by O. P. Sharma and Robert D. Retherford. Occasional Paper 1 of 1987. New Delhi: Office of the Registrar General and Census Commissioner, India. viii, 107 pp. Free. Available from Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India, 2/A Mansingh Road, New Delhi, India. *Demographic libraries may also request single copies from the East–West Population Institute.*

This study describes literacy trends in India, based on data from the 1961, 1971, and 1981 censuses. The study begins with an examination of literacy trends for all India, which is followed by an examination of trends for states and union territories. The section on states and union territories includes an examination of sex differentials and urban–rural differentials in literacy rates. Subsequent sections present an examination of age differentials in literacy rates, an analysis of the quality of literacy in terms of its changing composition by educational attainment, and an analysis of how female literacy and several development indices covary across 14

major states. The final section presents some rough projections of literacy rates for states and union territories.

—*Authors' abstract*

Regression Estimates of Fertility for India, 1971 and 1981 by N. Rama Rao, J. R. Rele, and James A. Palmore. Occasional Paper No. 3 of 1987. New Delhi: Office of the Registrar General and Census Commissioner, India. vi, 85 pp. Free. Available from Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India, 2/A Mansingh Road, New Delhi, India. *Demographic libraries may also request single copies from the East–West Population Institute.*

Estimates of the total fertility rate and crude birth rate are presented for all India, its major states, and urban and rural subdivisions of those states for both 1971 and 1981. These new estimates were prepared using Palmore's regression methods and the 1971 and 1981 Indian censuses. For 1981, the 5 percent sample of the census was used. For 1971, the 10 percent rural sample and the 20 percent urban sample of the census were used. The paper includes discussion of the Palmore method, compares the results using this method with the results of other estimation techniques, and assesses trends in fertility during the 1971–81 decade.

—*Authors' abstract*

AIDS in Asia . . .

previously rare type of pneumonia. Another major cause of death among AIDS patients is Kaposi's sarcoma, a rare cancer of the blood vessels that initially appears on the skin and eventually attacks the internal organs.

In Africa, "wasting" or "slim disease" is the local term for AIDS. Its associated chronic weight loss, recurrent fever, and diarrhea account for the majority of deaths there. It could be that Asian cases will resemble the African more than the U.S. pattern.

At present there is no cure for AIDS, and the development of a vaccine is at least a decade or two away. The drug azidothymidine (AZT) is helpful, however, in treating AIDS symptoms and in prolonging the lives of patients.

■ The global AIDS epidemic

No one knows for certain where AIDS originated. HIV has spread globally in several patterns.

The first is typified by North America, Europe, Australia, and New Zealand. In those regions and countries, where the virus has been present since the early 1980s, the major groups infected are homosexual and bisexual men and intravenous drug users. Some people have also acquired the virus through heterosexual contact (WHO 1987b).

The second pattern, most common in Africa and Haiti, spreads principally through heterosexual contact, both from man to woman and from woman to man. A high incidence of AIDS among heterosexual men and women exists in Central and East Africa.

There are few intravenous drug users in Africa, but the virus also spreads through the use of unscreened blood in transfusions and the use of unsterile injection equipment by medical personnel and traditional healers. As in other parts of the developing world, many patients in Africa demand injections because they associate them with modern medicine (Sabatier 1987a: 100). Because pregnant women in Africa are more likely than pregnant women elsewhere to become infected, the spread of HIV to infants has been much more common there than in other areas of the world.

In Asia, where the virus is still relatively rare, HIV infections have resulted primarily from contact between Asians and people from other parts of the world where the virus is more common. Exposure to blood or blood products from Europe or North America and sexual contact with infected persons from those regions have been the leading causes of infection among Asians. For example, the AIDS cases diagnosed in Asia by the end of 1986 were almost all among male and female prostitutes who had had sexual contact with infected foreigners, and among hemophiliacs who had received contaminated blood products from the United States. More recently, however, AIDS has also been diagnosed among Asian intravenous drug users (WHO 1987b).

■ Asian and Pacific focus

Cases of AIDS first began appearing in Asia in 1985. By early March 1988, Japan had reported 59 cases, Thailand 11, Philippines 10, India nine, Hong Kong six, and China, Singapore, and Sri Lanka two each.

Taiwan, Malaysia, Indonesia, and the Republic of Korea each reported only one case (Chinn 1988:41). The numbers are higher now, as indicated in recent public statements and news reports.

Nevertheless, as these small numbers suggest, Asian nations have yet to feel the impact of the AIDS global epidemic. With more than half of the world's population, Asia contains less than 1 percent of AIDS cases. Some experts have said that the number of reported cases in Asia is so small as to be unbelievable; but government officials have been quoted as maintaining that, although there may have been an initial reluctance to acknowledge the disease, they are now reporting AIDS cases to WHO (*Bangkok Post,* 28 November 1987).

According to some experts, the reporting problem may not have been that governments were hiding statistics on AIDS cases, but rather that "they were not looking hard enough" for them (*Bangkok Post,* 28 November 1987). The number of individuals reported to be infected with HIV would likely rise considerably if more testing were done among the high-risk groups in Asia—prostitutes, drug addicts, and prison inmates.

The challenge for Asian public health authorities is to identify the high-risk individuals, gain their cooperation in testing, and assure them that they will not suffer any punitive measures by volunteering for HIV antibody testing. The cost of testing and perhaps an initial reluctance to acknowledge the existence of AIDS may also help explain why so few cases have been reported from Asia.

Other suggested explanations for the small numbers of reported cases in Asia include biological resistance to the virus, greater use of condoms, and the smoking of illicit drugs rather than the injection of them with shared needles (*Asiaweek* 29 March 1987:49). Whatever the other reasons, because HIV has only recently spread to Asia, cases there are more likely than in other regions still to be in the asymptomatic phase. It is very likely only a matter of time, therefore, before symptoms will begin to appear and the number of AIDS cases in Asia will rise substantially.

Some Asian countries, particularly the Philippines and Thailand, are at greater risk than others because they are "sex holiday" destinations for men from Europe, the United States, Australia, and Japan. Prostitutes of both sexes who cater to foreigners are more likely to pick up the HIV infection from them than from local people. Though this fact may slow the spread of the virus outward from the infected groups concentrated in major cities, it seems unlikely to contain it completely (Panos Institute 1987:60).

Recent testing has shown the HIV infection turning up among increasing numbers of intravenous drug users, especially in Thailand. At a conference on retroviral infections held in Honolulu in February 1988, Dr. Praphan Phanupark, professor of medicine at Chulalongkorn Hospital School of Medicine in Bangkok, announced that of the 161 HIV-positive Thais, fully 86 were intravenous drug users.

More recently, the Thai Health Ministry announced that Thailand had nearly 900 HIV-infected individuals, 776 of whom were intravenous drug users (*Honolulu Advertiser,* 15 July 1988). If this type of HIV spread occurs in other Asian countries, many thousands of drug addicts could become infected. The U.S. Agency for International Development recently estimated there to be 500,000 heroin addicts in Thailand, 450,000 in Pakistan, 400,000 in Malaysia, and 48,000 registered heroin addicts in Burma (*International Herald Tribune,* 29 June 1987). (See Figure 3.)

Dr. Jonathan Mann, head of the global program on AIDS for the World Health Organization in Geneva, reported to the U.S. Presidential AIDS Commission in Washington, D.C. (*New York Times,* 19 April 1988):

> Somewhat to everyone's surprise, rather than sex or prostitution being the entry point for AIDS and the real point of amplification, the intravenous drug-user is playing that role. This Thai experience shows very clearly that Asia is just as vulnerable to an explosion of HIV infection as any other part of the world.

Once introduced into the drug-user population, AIDS could spread not only among drug users who share infected needles, but also to their sex partners, and thereby to a widening circle of others, including infants. Asian governments have been warned that, in spite of the small current number of AIDS cases, the epidemic could explode in their countries within the next five years unless improvements in health stan-
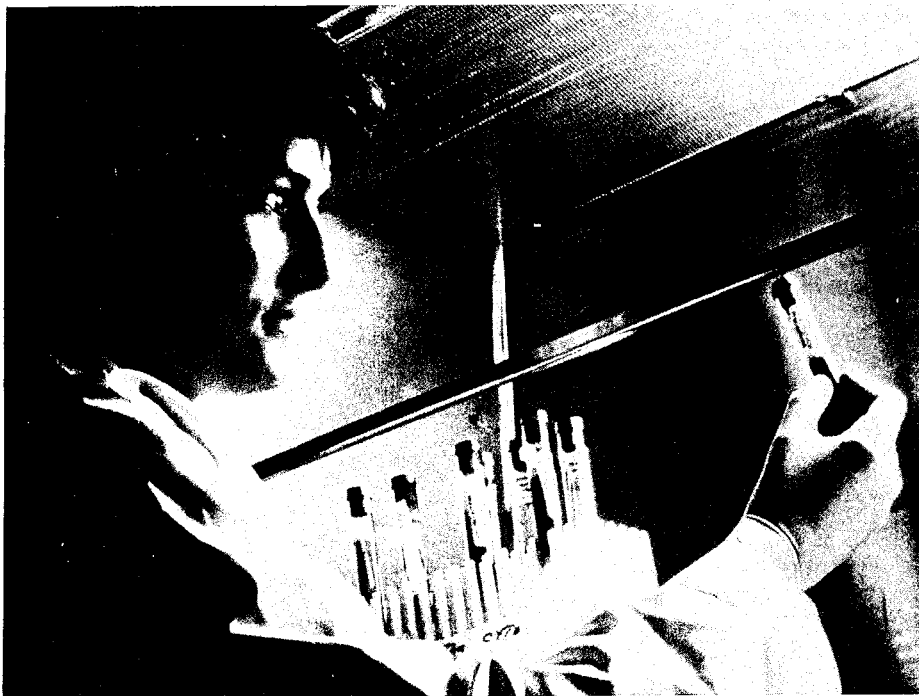

Figure 3. **HIV testing, because it could divert funds needed for basic health care programs, should focus on high-risk groups.**

NATIONAL INSTITUTES OF HEALTH

dards and public health education campaigns are undertaken.

According to Dr. John Dwyer, director of the AIDS Treatment and Research Unit at Prince Henry Hospital, Sydney, all the factors that have allowed AIDS to assume epidemic proportions in Africa—poor genital health of women, malnutrition, hepatitis, intestinal worms, low immunity levels—are just as endemic in Asia (ESCAP 1988). These factors are all suspected to reduce a person's resistance to disease, including HIV infection and AIDS.

It may be unreasonable to expect governments throughout the Asian and Pacific region to have already undertaken vigorous action against AIDS, because only three years have elapsed since the first reported case in 1985 and only several hundred cases have appeared since then. It is also understandable that, because the problem began in other parts of the world, many officials view it as imported from abroad and some public officials have therefore attempted to contain it at national borders or through selective sanctions directed at foreigners.

As the potential for an AIDS epidemic is as likely in Asia and the Pacific as elsewhere, more concerted action than inefficient screening at borders will be required.

As it becomes increasingly evident that the potential for an AIDS epidemic is as likely in Asia and the Pacific as elsewhere, however, more concerted action than inefficient screening at borders, which may not identify those recently infected,

will be required. The sooner that appropriate preventive public health measures can be undertaken, the better are the chances for containing the epidemic.

Dwyer (ESCAP 1988) has urged Asian nations to pattern their regional battle plans against AIDS after the African experience, not after that of Europe and the United States, because of the similarity of

public health conditions in Asia and Africa. The reports of increasing HIV infections among Asian drug addicts, however, suggests that Asia's pattern may be growing more similar to the European and U.S. pattern.

The shaded box beginning on this page reviews the AIDS situation in selected Asian and Pacific countries as of June 1988. Our information

Summary of AIDS in the Region

East Asia

China. The world's most populous country reports only a handful of cases of AIDS, which is regarded as a foreign disease. The import of foreign blood products is now banned, and blood tests are required for many Chinese who serve as translators, maids, cooks, and embassy employees for foreign diplomats. All foreigners staying longer than one year must be tested before entry. As of August 1987, China had no AIDS education program for the general public (*Los Angeles Times*, 9 August 1987:11).

Hong Kong. Hong Kong has reported 13 cases, of whom four have died. Another 72 residents are known to be HIV-infected, most of them hemophiliacs and homosexual or bisexual men. The government has launched an advertising and education campaign promoting safe sex and the use of condoms, and providing advice on the correct use of acupuncture needles (*Asiaweek*, 29 March 1987:53; 20 May 1988).

Japan. Japan ranks first among Asian nations in reported cases of AIDS, with 59. More than 1,000 cases of HIV infection or other pre-AIDS conditions have been identified. The great majority are hemophiliacs who were infected through imported blood products. The Health and Welfare Ministry now screens all blood supplies, and the 1988 health budget has been increased substantially to combat AIDS through research, the development of drugs and vaccines, and the establishment of medical information centers. AIDS is still viewed as a U.S. or western disease, and the government is reportedly considering a bill to bar foreigners who belong to high-risk groups from entering Japan (*Tokyo Journal* 1987).

Republic of Korea. One case of AIDS and 13 carriers of HIV had been detected by the end of 1987 (*Bangkok Post*, 18 January 1988). Officials periodically conduct AIDS tests on the estimated 12,000 prostitutes serving per-

comes chiefly from accounts in the Asian press and other public sources. Because the situation is changing rapidly, new statistics are reported frequently. WHO regularly provides updates of national AIDS statistics and medical progress against the disease.

■ The effects of AIDS

Unless brought under control, AIDS

could undermine decades of progress toward improved health and economic progress in the developing nations (Heise 1988:19). Combating an AIDS epidemic would raise medical care expenditures dramatically, particularly for less developed nations, which are least able to afford additional medical care costs.

Health care costs. The cost of treating any particular AIDS case varies with the symptoms, length, and severity of illness, as well as with the type of case management. Most estimates of direct medical costs have been of inpatient treatment in acute care hospitals. Other costs include the use of outpatient hospital clinics, physicians' offices, and long-term care facilities. Home-based services and the value of the services provided by family members, friends, and others in support of terminally ill patients' daily living requirements can also be considered costs (Institute of Medicine, NAS 1986:155).

In the United States, costs for inpatient medical care per AIDS patient have been estimated to range from about $34,000 to $147,000 per year, depending on the length of hospital stay and the availability of outpatient services (Hardy et al. 1986:210; Scitovsky and Rice 1987: 6). By 1991 the cost of providing health care and supportive services to a projected 145,000 AIDS patients in the United States will be between $8 and $16 billion (Koop 1987:6).

The World Bank (1988:266) has reported that, in 1986, health care accounted for an average of only 3.6 percent of central-government expenditures in low-income countries and only 4.8 percent in middle-income countries. Such limited allocations for health programs suggest that many developing nations will be unable to afford the high medical treatment costs associated with AIDS in the United States.

AIDS-related treatment costs and programs will likely compete for and possibly crowd out other medi-

sonnel of U.S. military bases. This program has been expanded to include about 100,000 women working at nightclubs and other spots frequented by foreign tourists. Foreigners applying for long-term visas must supply medical certificates showing they are AIDS-free (*Los Angeles Times*, 9 August 1987:12). *Asiaweek* (20 May 1988:) reported that South Korea has prison sentences for AIDS spreaders. The government is considering restrictions on foreign visitors, but short-term visitors, such as those attending the Seoul Olympics, would not be subject to these measures.

Taiwan. There have been four AIDS cases and 54 people who tested HIV-positive (*Bangkok Post*, 18 January 1988). Anti-AIDS measures include test centers in major hospitals and international airports. More than 60,000 individuals in high-risk groups have been tested, and a public information campaign is being conducted.

Southeast Asia

Philippines. Three homosexuals are known to have died after

contracting the virus. Through 1987, of the 41,927 Filipinos tested for HIV infection, only 52 were found to be seropositive. The great majority (38,429) were classified as "hospitality girls," mostly prostitutes working in bars around the two U.S. military bases in Angeles City and Olongapo and in Manila's tourist belt of Ermita. The issue of AIDS has even been raised in the negotiations between the United States and the Philippines over the continued presence of the U.S. bases (*Los Angeles Times*, 30 March 1987).

Singapore. Recent reports indicate nine individuals infected with HIV in addition to two AIDS cases. Singapore had no positive HIV reactions among 2,466 prostitutes examined. The Health Ministry has distributed at least 100,000 booklets to educate the public (Panos Institute 1987:63).

Thailand. With some 900 carriers of the HIV virus reported in Thailand, there have been 12 AIDS cases reported since 1984, including four among foreigners

cal services and programs, such as malaria and diarrheal diseases control and immunization programs. Treating AIDS patients will put a greatly increased burden on such scarce health resources as hospital beds, pharmaceuticals, and medical personnel.

AIDS-related treatment costs and programs will likely compete for and possibly crowd out other medical services and programs.

The governments of less developed Asian and Pacific nations may be unable to allocate large amounts of public funds to combat AIDS when they are struggling to find adequate resources for basic medical care for the majority of their peoples. Dr. Ofelia Monzon, a researcher at the Research Institute for Tropical Medicine in the Philippines, has summarized this problem very clearly (*Los Angeles Times,* 30 March 1987:8):

> Thousands of Filipinos are still dying each year of stomach disorders, tuberculosis and pneumonia—curable diseases—because they live in places where modern medicine still does not reach them. Here, we're talking about containing an incurable disease [AIDS] that has only begun to show up, when we cannot even save the lives of people who suffer from diseases we can cure.

In developing nations, the costs of screening for HIV infections also may be unaffordable. A single ELISA (enzyme-linked immunosorbent assay) test to detect HIV antibodies in blood samples in the Third World costs around US $1, and the confirmatory western blot test costs

$30–$50 (see Appendix for definitions); one machine for reading blood samples costs up to US $15,000 (Tinker 1988:44). Recently, however, scientists have been attempting to develop more rapid and cheaper tests for the AIDS virus.

Economic costs. In addition to the direct costs of health care for individuals infected with HIV are many indirect costs. These include not only the loss of wages for sick individuals, but also the loss of future earnings for persons who are permanently incapacitated, or who die prematurely.

Bloom and Carliner (1988:606) estimate that in the United States the lost earnings from AIDS victims are about six to eight times greater than the medical costs. By the end of 1991, indirect losses could rise to between $146 billion and $168 billion. Thus, if AIDS were to reach epidemic proportions in Asia and the Pacific, the economic effects of forgone output for a society there would probably far exceed the direct medical costs.

The economic effects of lost productivity might be most serious in developing nations. Jon Tinker, president of the Panos Institute, observed (1988:44):

> Most third world diseases kill mainly the very young and the old. But the vast majority of deaths from AIDS in developing countries will be among the sexually active age groups, the people who are the wage earners, and the food producers. . . . Deaths in this breadwinning age group will mean that each worker will have more dependents to support.

Some scientists think, however, that this will not prove to be the case because there are also many pediatric AIDS cases who die and do not remain dependent.

In developing nations, the poor may suffer most from the social and economic fallout from an AIDS epidemic. Tinker (1988:46) predicts:

> The global underclass—those who live in rural and urban shantytowns and squatter settlements, . . . who cannot afford condoms and are not reached by family planning advice, who often cannot read and are therefore least likely to be reached by educational campaigns, who have little or no access to health clinics, whose medical needs have to be satisfied by street-corner injections—will be disproportionately affected by AIDS.

Other researchers believe Tinker may be overemphasizing this class issue because HIV infection may be more related to sexual promiscuity and choice of partner than to status group, and in Africa HIV infection is prevalent among upper-status groups (N'Galy 1988).

Social costs. AIDS extracts a heavy emotional toll on patients and their families, who face anxiety, depression, despair, and grief. Health care workers and therapists must deal with new modes of treatment and patient counseling, while worrying about accidental infection on the job. The demand for mental health services will increase as more psychiatric and neurological disorders are linked to AIDS.

AIDS also accentuates social divisiveness. Almost universally, the official response to the appearance of HIV infection in a society has been to try to locate the source of the epidemic in another country, culture, or race. Despite the enormous cost and inconvenience of testing—not to mention the inability to detect HIV infection in those whose exposure to the virus is recent—mandatory testing of immigrants, foreign students, military

personnel, and travelers is being undertaken or considered in many countries.

In the United States, such high-risk groups as homosexuals, prostitutes, intravenous drug users, hemophiliacs, minorities, and the poor have become targets of discrimination, ridicule, and even violence (Ergas 1987:35). Violent homophobic backlash has already been reported in the United States, Europe, Brazil, and Mexico (Sabatier 1987b:713). As the number of HIV infections rises, polarization between those who are carriers, or thought to be in high-risk groups, and those who are not could increase.

Demographic effects. The effect of AIDS on population growth rates and the demographic structure of nations is difficult to estimate because detection of the disease is so recent and knowledge about it so limited. Researchers from the Parasite Epidemiology Research Group of Imperial College, London University, studied the potential demographic impact of the disease in developing nations, using mathematical models. Their results suggest that high rates of HIV infection sustained over many decades are capable of producing declining rates of population growth and even declines in population size (Anderson et. al. 1988:228).

Other demographers argue such an outcome would be unlikely. The projection by Anderson and his colleagues depends on assumptions of no change over a 50-year period in the behavior of the general population and the spread of HIV infection at a rate currently found only among prostitutes and other high-risk groups. If appropriate public

(*Honolulu Advertiser*, 15 July 1988). More than 180,000 people have been tested for the virus. Male prostitutes, intravenous drug users, and prison inmates show the highest rates of HIV infection, whereas others tested, such as female prostitutes, blood donors, and laborers going to the Middle East, show the lowest (*Far Eastern Economic Review*, 5 November 1987). The Thai Red Cross has not found any HIV-contaminated blood to date in more than 4,000 samples (Panos Institute 1987:63).

Thailand initially rejected a full-scale anti-AIDS campaign, fearing its effect on tourism, but a more extensive campaign has been proposed that would include mandatory testing of blood donations, education campaigns in secondary schools, and free distribution of condoms at clinics. The Population and Community Development Association has conducted a campaign to provide AIDS information to educational institutions, government agencies, and businesses.

Elsewhere in Southeast Asia. Two cases and five carriers have been reported in Malaysia, and the government there is considering requiring foreigners to undergo testing for AIDS. Government officials have expressed concern about the possible spread of AIDS among intravenous drug users. Indonesia also has reported one case. Both countries have low-key information campaigns about the disease (*Bangkok Post*, 18 January 1988).

South Asia

India. Of an unspecified number of people tested for HIV, 191 have been found to be seropositive. Twelve reported cases with AIDS symptoms have all been foreigners or Indians who had been living abroad. The Indian government now requires mandatory testing of all foreign students and all tourists visiting the country for more than one year. African students with HIV have been deported (*Los Angeles Times*, 9 August 1987:11).

Of great concern to Indian health officials is the possibility that the AIDS virus will be widely transmitted through contaminated needles and syringes used for vaccinations and medical injections. This could become a huge problem in India, where disposable needles are too costly for most rural clinics to throw away and may be used hundreds of times. The government is undertaking extensive screening for AIDS in 40 centers across the country and is conducting a campaign to stop the reuse of disposable needles (*Los Angeles Times*, 9 August 1987:12).

Elsewhere in South Asia. Only two AIDS cases have been reported in Sri Lanka. A Briton suffering from AIDS has been deported. The government is concerned about AIDS spreading in tourist areas and requires testing of all hotel and restaurant employees approved by the Tourist Board. Bangladesh, Nepal, and Pakistan have reported no cases of AIDS.

Oceania

In Oceania, 787 AIDS cases have been reported from four countries. Australia has reported more than 700 cases, and New Zealand nearly 40. Single cases have been confirmed in French Polynesia and Tonga. The cases in Australia and New Zealand have been primarily among homosexuals (80 percent) and hemophiliacs. Heterosexual contact and intravenous drug use each account for only about 1 percent.

WHO officials report that Australia has one of the most imaginative and far-reaching AIDS control programs in the world. The program emphasizes community-based education targeted at a wide range of groups. An

"AIDS bus" dispenses condoms and provides health advice to Sydney's streetwalkers, and powerful anti-AIDS television commercials have been aired in 16 languages (*Los Angeles Times*, 9 August 1987:13).

Guam has reported six AIDS cases, and the Trust Territory of the Pacific Islands (on behalf of the Republic of the Marshall Islands) one case. Seven other AIDS cases diagnosed among Pacific Islanders have either died or gone for medical care to Hawaii or the U.S. mainland. Other Pacific Islanders with AIDS have returned to their island homes and are receiving medical care from local health care institutions (Villagomez 1988:2–3).

education campaigns are undertaken and behavior is changed, this projection may not be an accurate forecast.

Contrary to the view (e.g., of Tinker 1988) that because the sexually active adult population is more likely than older people or children to become infected with HIV, an AIDS epidemic would cause the dependency ratio to rise, Anderson et al. (1988) suggest that the potential spread of the disease would have little effect on the age structure of populations or dependency ratios. According to them (p. 233), "for some plausible ranges of values, AIDS would have little effect on, or even slightly decrease, the dependency ratio."

Their reasoning is that, although "the direct effects of mortality in the sexually active adult age classes due to AIDS tends to increase the ratio, . . . the general depression of the overall population growth rates due to adult deaths, and to the reduction in effective birth rates due to the deaths of infected babies, tends to decrease the ratio" (pp. 232–233).

The effect of AIDS on mortality patterns in individual countries is likely to vary according to each country's place in the epidemiologic transition. In countries at the earlier stages of the transition, where the major causes of morbidity and mortality are still malaria, diarrheal diseases, and malnutrition, we speculate that the effect of AIDS could be greater than in countries further along in the transition, where the leading causes of death

are degenerative and man-made diseases, such as cardiovascular disease and cancer.

Anderson et al. stress that their results are derived from deliberately simplified models and limited empirical data. Their purpose is "setting the agenda for data collection to improve the accuracy of predictions" (p. 233). In particular, they cite the need for better data on the sexual activity of various groups within society, as well as the need for more information about infectiousness and transmission rates related to HIV. Because HIV is transmitted through sexual contact, as well as contaminated needles and blood products, the AIDS epidemic is strongly related to the sexual conduct of the general population and the various subgroups within it.

Public education campaigns aimed at changing sexual behavior are essential to control the spread of AIDS, Anderson and his colleagues believe. "The predictions of our simple models highlight the urgency of implementing such programs" (p. 233). Bulatao and Bos (1988:6) of the World Bank agree that "in a situation where HIV is relatively widely spread, changes in sexual behavior are essential to reduce the scale of the epidemic. Earlier changes lead to better containment than later changes."

Other sexually transmitted diseases appear to increase susceptibility to HIV, though the evidence is limited. Piot et al. (1988:578) believe the control of other sexually transmitted diseases could prove to be a means for indirect control of HIV transmission.

Condom use, in particular, may be an effective means of preventing HIV infection, just as it has been

shown to prevent many other sexually transmitted diseases. The current public education campaign within the United States encouraging "safe sex" urges the use of condoms, as well as limiting sexual relationships to a reliable partner. The use of condoms varies greatly, however, among societies and groups within them.

Condom use may be an effective means of preventing HIV infection, just as it has been shown to prevent many other sexually transmitted diseases.

In Asia, condoms are widely used for family planning, especially in China and Japan. They are also among the leading contraceptive methods in Singapore and Pakistan (Bulatao and Palmore 1988:chap. 14). Encouraging the use of condoms, particularly those containing the spermicide nonoxynol–9, for family planning is likely to help contain the spread of AIDS as well as other sexually transmitted diseases, although this method does not provide as high a level of protection against pregnancy as certain other methods.

Health care and family planning providers may need to encourage use of two contraceptive methods, one for effective protection against AIDS, the other for effective protection against unwanted pregnancy. It may be unrealistic, however, to expect many clients to use two methods consistently (Donovan 1987:112).

As yet, there is little evidence about any relationship between AIDS and other family planning

methods. Piot et al. (1988:575) have noted the possibility that oral contraception may increase women's susceptibility to sexually-acquired HIV infection. Their report of an increased risk of HIV infection among pill users independent of sexual activity, was based on a study of prostitutes in Nairobi, Kenya, and has yet to be confirmed by others.

AIDS appears to reflect and magnify existing infectious diseases. Sabatier (1987a:100) has reported that the increase in tuberculosis (TB) in Haiti and Africa is probably due to the HIV virus. TB has also been diagnosed among many AIDS patients in the United States.

If a person has had TB, it can remain dormant after being conquered by the immune system, but the individual remains a lifelong carrier. When HIV infects a TB carrier, the weakened immune system allows the TB bacteria to attack. Because the person becomes contagious, an epidemic of TB could be loosened in a healthy community by an HIV carrier who may have no apparent AIDS-related symptoms (Sabatier 1987a:100).

Piot et al. (1988) have observed that HIV infection has effects on carriers of syphilis similar to the effects found for TB. "These effects may lead to higher rates of transmission of endemic diseases in the population. Consequently, standard management of common diseases may become less effective, and more expensive approaches may have to be used" (p. 578). Sabatier (1987a:100) has noted: "By being a potential instigator of other infectious diseases, AIDS poses multiple challenges to health systems wherever it spreads."

There is growing concern about the possibility that other infectious diseases may hasten the progression from HIV infection to AIDS. The U.S. Department of State (1987:2) warned its overseas personnel that "there is an increasingly strong suspicion among experts that repeated exposure to viral, bacterial, parasitic and fungal infections activates the latent HIV virus and hastens the progression to the fully-manifested and uniformly fatal AIDS." The department also noted that in areas where vaccination against contagious diseases is required, "it is theorized that vaccines can activate a latent HIV infection into destructive activity" (p. 9).

The potential impact of AIDS on mortality rates in developing nations must include both the effect of deaths from AIDS itself, and an increase in deaths from other diseases, not only among high-risk sexually active men and women, but also among children of these women. "In areas where ten percent or more of pregnant women are infected with the AIDS virus, infant mortality from this cause alone may exceed the infant mortality rate from all causes in industrialized countries" (Mann 1988:6).

■ Efforts to combat AIDS

The magnitude of the global AIDS epidemic represents a challenge to international cooperation if the containment of HIV infection is to be achieved. The World Health Organization is acting as the spearhead for the global attack on AIDS. WHO's Global Programme on AIDS (GPA) was established in February 1987 with three objectives: to prevent HIV transmission, to reduce morbidity and mortality associated with

HIV infections, and to unify and unite national and international efforts to control and prevent AIDS (Piot et al. 1988:579).

Specific tasks assigned to the GPA include assisting governments to create national AIDS control strategies and to develop, implement, and monitor activities that teach people how to prevent the further spread of HIV infection; supporting, promoting, and coordinating AIDS research in medical, social, behavioral, and other fields; and helping to describe current and predict future trends in HIV infection and to assess the economic and social impact of the epidemic (Sabatier 1987a:102).

National AIDS committees have already been established in more than 150 countries. Since February 1987, governments of 111 countries have entered into collaboration with WHO to support and strengthen their national AIDS programs (Mahler 1988:2). At the request of these governments, WHO is providing staff and organizing workshops to train laboratory workers, who in turn will train others in the latest AIDS laboratory techniques.

The GPA has sponsored 32 technical and scientific meetings and consultations on research and policy issues and published over 30 consensus statements, reports, guidelines, and articles on such subjects as criteria for HIV screening, advice on international travel, safety of blood and blood products, and AIDS prevention and control (WHO 1987a). The 1987 budget for these activities was approximately US $37 million, of which $25 million was provided by development aid authorities from 10 nations in Europe and North America. For 1988,

the program is estimated to require $66.2 million.

WHO has also been working closely with the United Nations Children's Fund (UNICEF) in addressing the AIDS challenge. Experts from WHO and UNICEF believe that HIV-contaminated breast milk is unlikely to prove a principal route for the transmission of the virus from mother to child and strongly recommend that mothers continue to breastfeed their babies because of breastfeeding's nutritional and health benefits.

Another problem that WHO and UNICEF foresee is the potentially negative impact that AIDS could have on vaccination programs. Over the past decade, many highly successful infant and child immunization programs have been conducted against measles, whooping cough, polio, tetanus, and other avoidable —and often fatal—diseases. But babies infected with HIV are likely to have immune systems working less effectively than normal, even before they show any symptoms of AIDS (Sabatier 1987a:100).

Some virologists worry that early childhood vaccination, particularly when live vaccines are used, could induce the very disease that the innoculation is supposed to prevent, although there is no evidence so far that this has happened (CDC 1986:595). Nonetheless, WHO and the U.S. Centers for Disease Control still recommend childhood vaccinations. UNICEF is distributing easily sterilized reusable needles and the equipment needed to keep them clean to clinics that carry out immunization.

WHO and the United Nations Development Programme (UNDP) recently formed an alliance to

coordinate the campaign against AIDS in developing nations. The WHO–UNDP alliance should help ensure that governments involve a wide spectrum of their ministries in designing, implementing, and evaluating national AIDS programs and give AIDS priority in national development plans and budgets. The alliance will also coordinate UN support to national AIDS programs and help governments to coordinate all external support to those programs. It will strengthen support for teams from the GPA based in many countries (WHO 1988).

The U.S. Agency for International Development (USAID) views the AIDS global epidemic as an enormous potential threat to the economic and social development of less developed countries. Key components of a new USAID policy on AIDS are prevention and control of the HIV epidemic through bilateral assistance efforts and support of and coordination with WHO's Global Programme on AIDS (USAID 1988:1).

The agency has launched several programs to control the spread of HIV and monitor the epidemic and its effect on development (USAID 1988:1). The programs cover a wide range of activities, highlights of which are:

• increased funding each year (since 1986) for anti-AIDS activities to a projected $30 million for fiscal year 1988;

• AIDS Technical Support Project: Public Health Communications Component (AIDSCOM), a five-year, $15.4 million project to use lessons learned from social marketing and behavior analysis to help national AIDS committees develop effective models of public education, social

mobilization, and counseling for AIDS prevention;

• AIDS Technical Support Project: Technical Assistance Component (AIDSTECH), a five-year, $28 million project providing technical assistance for epidemiological surveillance, prevention of sexual transmission, blood screening, and consultation on the financing of AIDS health care and prevention;

• provision of condoms for AIDS prevention to 21 developing countries to date;

• operations research to assess the interaction of family planning and AIDS prevention activities, development of improved condoms and spermicides, and numerous training and educational activities;

• collaboration with WHO and UNICEF activities;

• and sponsorship of the attendance of hundreds of international public health officials and scientists at conferences and meetings around the world (USAID 1988:2–5).

The World Bank began direct lending to governments for health programs in 1980 and by 1983 had become, along with the United States and Japan, one of the three largest funders of health programs in less developed countries. The Bank is providing support for the fight against AIDS through existing health loans and may in the long run become the major funder.

Nongovernmental organizations, such as the League of Red Cross and Red Crescent Societies, and private voluntary organizations are also contributing their assistance to the global efforts to control the spread of AIDS.

■ Policy recommendations

The fact that HIV infection can oc-

cur without initial symptoms for a period of years allows the virus to spread, potentially widely, before the need for preventive measures is recognized. This delay means that the eventual containment of AIDS may become more difficult. It is critical, therefore, that governments begin immediately to develop policies and plans for containing the spread of HIV infection, even if the number of recognized AIDS cases is small at present. There is broad agreement among health care professionals about policies likely to be most effective in AIDS prevention and control.

Perhaps most important, because AIDS is spread primarily through voluntary behavior, in particular through sexual activity and intravenous drug use, prevention efforts should be targeted at changing those specific behaviors that place individuals at greater risk of HIV infection. Educational programs focusing on behavior modification of high-risk groups may yield the greatest return in containing the spread of HIV infection in Asia and the Pacific.

Educational programs focusing on behavior modification of high-risk groups may yield the greatest return in containing the spread of HIV infection in Asia and the Pacific.

All countries should develop and implement specific preventive programs for such high-risk groups as prostitutes, intravenous drug users, and prison inmates. These programs should include low-cost HIV screening that encourages voluntary

cooperation, ensures confidentiality, and does not result in any punitive or discriminatory actions against those who participate.

It is important that counseling accompany all such testing programs, not only to encourage modified behavior among high-risk groups, but also to explain the meaning of the test results and to provide psychological help to those who test positive.

HIV testing of tourists, international travelers (both long- and short-term), foreign students, foreign workers, and students returning from study abroad is strongly discouraged because it is logistically impractical, questionably effective in changing behavior, scientifically not always accurate, and wasteful of scarce resources better spent on activities of known value. Educational programs are less costly and less intrusive measures for preventing HIV transmission than such screening programs.

A variety of public and private clinics and other institutions currently provide reproductive counseling, family planning services, and maternal and child health care. These programs should provide information to their clientele about the transmission of HIV, safe sex practices, and other measures designed to contain the AIDS epidemic.

Every country should develop a national AIDS control plan and create a national AIDS committee to coordinate activities related to the disease. Such activities should include establishing a surveillance system to monitor the appearance of AIDS cases and HIV infections, integrating all HIV prevention and control programs with primary

health care delivery, providing AIDS education for health care workers, and incorporating AIDS education into the work of sexually transmitted disease (STD) programs, clinics, and centers.

In countries where school curricula include sex education, AIDS education appropriate for each age group should be integrated into those curricula.

Public health experts assert there is no scientific rationale to justify isolation, quarantine, or discriminatory measures against individuals based solely on the fact of their being known or suspected to have HIV infection. Moreover, the experts urge that childhood immunization programs continue on schedule, because the dangers of childhood diseases outweigh the potential AIDS-related dangers of vaccination.

Public health experts find no scientific rationale to justify isolation, quarantine, or discriminatory measures against individuals based solely on their having HIV infection.

It is important that public health systems establish the necessary laboratory, hospital, and other resources to assure the safety of donated blood and to prevent HIV transmission through unsterile or shared needles. WHO has recommended that countries consider distributing sterile needles to intravenous drug users to stem the spread of HIV, noting that there is no evidence that needle and syringe distribution programs have in-

creased levels of illicit drug use among recipients, encouraged others to begin injecting drugs, or reduced demand for addiction treatment (*American Medical News,* 12 February 1988:47).

Given the many other development and public health needs of most Asian and Pacific nations and their limited resources, it may prove politically as well as economically difficult for them to mount major public campaigns against AIDS in the absence of widespread infection among the general population. But there is much that existing public health and family planning programs could accomplish in preventing the spread of HIV infection.

With the support of international health agencies, national AIDS control programs are being established throughout the world (Piot et al. 1988:579). Asian and Pacific policymakers should benefit from the position their nations still enjoy of having few AIDS cases, and from the scientific knowledge and public health policy experience developed since the epidemic appeared in other areas of the world.

Together, these conditions provide a unique, but temporary, opportunity to embark on the necessary preventive programs and public education strategies that hold promise for preventing the spread of HIV infection and avoiding or containing a potential AIDS epidemic in the region.

APPENDIX: Definitions of Commonly Used Terms Related to AIDS

Antibody. A protein produced in response to foreign material that enters the body.

Acquired immunodeficiency syndrome (AIDS). A usually fatal clinical condition caused by a retrovirus and characterized by infections that indicate underlying cellular immunodeficiency.

AIDS-related complex (ARC). A combination of physical problems, existing over time, that indicate infection of a person with human immunodeficiency virus (HIV). Symptoms include fatigue, fever, weight loss, diarrhea, night sweats, and swollen lymph nodes.

Case fatality rate. A measure of the number of individuals with a disease who die of it during a specified period.

Cofactor. A factor other than the basic causative agents of a disease that increases the likelihood of developing that disease. Cofactors may include other microorganisms or psychosocial factors, such as stress.

ELISA (acronym for enzyme-linked immunosorbent assay). A test used to detect antibodies against HIV in blood samples.

HIV infection. The establishment of HIV in cells of a person's body. Once infection occurs, the possibility exists for the virus to be present in the blood and body fluids, although the infected person may not show symptoms of illness.

Human immunodeficiency virus (HIV). HIV-1 (previously called HTLV-3 or LAV) is the retrovirus generally responsible for causing AIDS. HIV-2 is a second form of HIV discovered in 1986 in West Africa that also causes AIDS.

Immune system. The body's natural system of defense mechanisms, in which specialized cells and proteins in the blood and other body fluids work together to eliminate disease-producing microorganisms and their foreign substances.

Opportunistic infection. An infection caused by a microorganism that rarely

causes disease in persons with normal immune systems.

Seropositive status. In the context of HIV, the condition in which antibodies to the virus are found in the blood.

Western blot technique. A test that involves identifying the presence of antibodies against specific protein molecules. This test is more specific than the ELISA in detecting antibodies to HIV in blood samples, but more difficult to perform and much more expensive. Some laboratories use it to confirm samples found to be repeatedly reactive in ELISA tests.

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Strength of Fertility Motivation . . .

(continued from page 12)

mination R^2 in ordinary least squares multiple regression) increases only from 0.154 to 0.172.

This result indicates that, although RPI has a substantial and highly statistically significant effect on current use in model 2, the effects of RPI are largely captured by the other independent variables in model 1 (except for age at first marriage) because RPI is correlated with these other variables. Thus RPI appears to play a mediating role between the socioeconomic factors and current contraceptive use and does not add greatly to the explained variation in contraceptive use as measured by R^2. (By "mediating role" in this context, we mean that socioeconomic factors affect RPI, which in turn affects contraceptive use.)

Unfortunately, one cannot test the difference between models 1 and 2 using the logit regression analogue of R^2, since the sampling distribution of this statistic is unknown. A test of global difference in fit can be done, however, using the likelihood statistics in the last two rows of Table 3. The difference between models 1 and 2 in −2 log likelihood is approximately distributed as chi-square, with degrees of freedom equal to the difference in the number of estimated coefficients in the

two models. The difference in −2 log likelihood between models 1 and 2 is 26, with 6 degrees of freedom, indicating that the two models differ significantly at the 1 percent level, despite the small difference in R^2. Evidently RPI has some independent effect on contraceptive use that is not captured by the background variables, but it appears to be rather small.

When intention to use contraception in the future is substituted for current use of contraception, in the right half of Table 3, the results for models 3 and 4 are somewhat similar to those for models 1 and 2, except that the effects of the independent variables on the odds of intention to use are attenuated (i.e., closer to one). In model 3 the effects of number of living children, age at first marriage, and urban residence are no longer statistically significant. In model 4 the effect of RPI tends not to be statistically significant, and the addition of RPI to the regression increases R^2 almost not at all, compared with the value of R^2 in model 3.

The odds ratios for RPI = 0 and RPI = −1 in both models 3 and 4 are exceptions to the general lack of statistical significance of RPI in these models. These two odds ratios are low and highly statistically

significant. The very low odds ratio of 0.22 for RPI = 0 suggests that women who say they do not know whether they want another child tend to be fatalistic and for that reason are unlikely to express an intention to use contraception in the future. Why the odds ratio for RPI = −1 should also be low, at 0.49, is not clear.

Interestingly, the chi-square test of difference in global fit between models 3 and 4 again indicates significance at the 1 percent level, despite the generally low levels of significance of the RPI dummy variables and the small difference in R^2 between the two models.

It is perhaps not surprising that the independent variables have larger effects on actual use than on intention to use contraception in the future, since intention refers to some indefinite time in the future and is therefore less subject to reality constraints. Moreover, an affirmative answer to the question about intention may be given simply to please the interviewer.

As already mentioned, the odds ratios in Table 3 are easier to interpret than the underlying logit regression coefficients (not shown), from which the odds ratios are calculated. Easier yet to interpret are the predicted percentages of women

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currently using or intending to use, which can also be calculated from the underlying coefficients (Table 4).

The unadjusted columns in Table 4 are based on simple bivariate logit regressions, and the adjusted columns are based on multivariate logit regressions with control variables set at their mean values. We have subdivided the unadjusted columns by urban and rural residence because of the oversampling of the urban population, which makes the sample unrepresentative at the national level. It was not likewise necessary to split the adjusted column by residence, because in this case urban residence is included as an independent variable.

The adjusted columns show the net effect of each variable, holding constant remaining variables in the model at their mean values. The results for current use again suggest that RPI tends mainly to mediate the effects of socioeconomic background variables on current use.

Table 4 also shows, more clearly than Table 3, a large gap between intended use and current use, which is much lower. (This latter finding must be interpreted cautiously, however, because the results for current use and intended use are based on different subsamples.) There appears to be considerable latent receptivity to family planning among nonusers.

Both current use and intended use first rise, then fall, as the number of living children increases, forming the inverted U pattern already mentioned. Both current use and intended use also tend to rise with age at marriage, but the adjusted effects are quite small. The adjusted effects of residence are

Table 4. **Effects of demographic and socioeconomic variables on current use of contraception and on intention to use contraception in the future: logit regression estimates of risk, expressed as percentages of women using or intending to use, Nepal 1986 Fertility and Family Planning Survey**

	Currently using			Intending to use		
	Unadjusted		Adjusted	Unadjusted		Adjusted
Characteristic	Urban	Rural	Urban + Rural	Urban	Rural	Urban + Rural
Number of living children						
1	8.7	1.8	2.4	33.4	23.2	23.3
2	17.5	3.5	3.2	33.5	25.0	25.8
4	5.6	5.2	2.7	35.2	23.8	27.7
6	0.0	2.7	0.8	38.9	16.9	25.0
8	0.0	0.4	0.1	44.8	8.6	18.8
Age at first marriage						
15	7.0	2.7	1.9	33.2	22.5	24.3
20	11.4	3.3	2.9	35.3	23.7	24.7
25	18.1	4.1	4.3	37.5	25.0	25.0
Residence						
Urban	na	na	2.0	na	na	24.6
Rural	na	na	2.4	na	na	24.4
Woman's education						
0	5.2	3.0	2.2	30.1	21.3	23.1
2	7.1	2.9	2.5	33.2	28.7	26.1
4	9.7	2.8	2.9	36.4	37.5	29.3
6	13.1	2.7	3.3	39.8	47.2	32.7
8	17.4	2.6	3.8	43.2	57.0	36.3
10	22.8	2.6	4.4	46.7	66.4	40.1
Amenities						
0	1.0	1.8	1.3	22.1	19.1	20.5
1	2.8	3.7	2.6	28.1	26.5	25.5
2	7.6	7.7	5.2	35.1	35.5	31.3
3	18.8	15.3	9.9	42.7	45.7	37.7
4	39.5	28.2	17.9	50.7	56.3	44.7
Relative preference intensity						
-3	13.8	13.0	7.0	47.7	20.6	23.9
-2	29.6	6.1	7.5	33.3	28.6	25.9
-1	22.7	1.6	3.8	22.7	17.7	15.5
0	19.0	1.2	4.0	19.0	4.9	7.6
1	23.1	5.0	4.8	30.8	28.3	25.8
2	9.0	2.0	2.5	29.9	25.0	26.2
3	2.8	1.4	1.2	37.3	23.3	27.1

Note: By risk is meant probability of currently using or probability of intending to use contraception. The unadjusted columns are based on simple bivariate regressions, except for the regression on number of living children, which includes a squared term, and the regression on relative preference intensity, which includes six dummy variables to represent the seven possible values of this characteristic. Each set of bivariate regressions was run separately for urban and rural women. The adjusted columns are based on multivariate logit regressions that include all the independent variables shown in the table. In the adjusted columns, the effects of any given variable on current use or intent to use were calculated by holding constant the other independent variables by setting these other variables at their mean values in the entire sample. The multivariate regressions were run for the entire sample, including both urban and rural samples.

na—not applicable.

negligible. In the adjusted results, the effect of education on intended use is large, but the effect of education on current use is small. In contrast, the adjusted effect of amenities is large, on both current and intended use. The effect of amenities on current use is small at lower levels of amenities but considerably larger at higher levels of amenities.

The adjusted effect of RPI on current use is substantial overall, but differences in proportions using between adjacent RPI categories are in most cases small. In contrast, the adjusted effect of RPI on intended use is small and erratic. The unusually low proportion intending to use among women for whom RPI equals zero again stands out.

■ Conclusion

Strength of fertility motivation, as measured by relative preference intensity (RPI), contributes to the explanation of current contraceptive use, over and above the effects of demographic and socioeconomic background variables usually included in analyses of the determinants of contraceptive use. The effect of RPI is large and highly statistically significant. Most of this effect, however, appears to be captured by the background variables when RPI is deleted from the model. Including RPI in the model, as opposed to excluding it, attenuates the effects of the background variables and improves global fit only modestly, even though this improvement is highly statistically significant. These findings indicate that strength of motivation plays a mediating role between demographic and socioeconomic background variables and contraceptive use but does not have a large in-

dependent effect on use. In other words, background variables affect motivational strength, and motivational strength affects use; but when motivational strength is deleted from the model, background variables alone do almost as good a job of explaining use as do background variables and motivational strength together.

The findings also indicate that the independent variables have considerably larger effects on current use than on intended use. When intention to use contraception in the future is substituted for current use of contraception as the dependent variable, the effects of RPI are mostly small and statistically nonsignificant. The effects of the demographic and socioeconomic background variables are also reduced, and the inclusion of RPI in the analysis improves global fit only very slightly. Again, however, the marginal improvement in global fit is highly statistically significant.

These results raise the question of whether strength of fertility motivation can be affected by educational efforts mounted by family planning programs to increase contraceptive use. Our analysis shows that strength of motivation does have some independent effect on contraceptive use, and it is quite possible that this independent effect could be enhanced by educational programs operating independently of the socioeconomic characteristics of program recipients. Because the 1986 survey lacks relevant data, we have not been able to explore this possibility empirically.

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