11 Demographic Significance of Unmet Need

One of the primary reasons for estimating the extent of unmet need in a population is to determine how much potential effect its satisfaction would have on the fertility rate. Here, the authors estimate this potential under four different assumptions about what kinds and amounts of unmet need are satisfied.

11.1 MODELS OF UNMET NEED SATISFIED

As has been seen, the diverse kinds of unmet need imply different kinds of program responses. Most unmet need would not be satisfied simply by providing additional contraceptive supplies or by making access more convenient or costs lower. Significant fractions apparently in need say that they do not intend to use any method because they are ambivalent about the timing of the next child, or because they are uninformed; others cite side effects or religious objections or objections of their partner, or report they are no longer exposed to the risk of pregnancy. To assume that all unmet need can be met, even among women who do not intend to use a method, and that all the different impediments can be overcome is extremely unrealistic but is useful simply to estimate the upper limit of the demographic potential of eliminating unmet need. Thus, Model 1 assumes the elimination of all unmet need.

The second model assumes the opposite extreme, i.e., that all married women in need who say that they do not intend to use a method in fact will not use. Whereas the first model will have the greatest impact on fertility, Model 2 will have the smallest. This model simply accepts at face value women's responses that, for whatever reason, they will not use contraception in the future.

A less stringent assumption is introduced in Model 3, i.e., that only those women in need who do not intend to use because they feel they are not exposed to risk (they report that they have difficulty becoming pregnant or that they have infrequent sex) in fact do not use. This implies that all of the other women who are in need but who do not intend to use are informed about contraception or are persuaded to overcome various kinds of objections to use.

Many alternative sets of assumptions can be imagined, but let us conclude with only one additional model, Model 4, which is our best estimate of the potential effect on fertility of eliminating unmet need. All of the preceding three models make different assumptions about the subset of women in need who report that they do not intend to use contraception. They assume, however, that all of those women who say they do intend to use in fact follow through on these intentions. This is clearly an exaggerated expectation. So, Model 4 relaxes this expectation and assumes (arbitrarily) that 20 percent of those women with a spacing need who intend to use a method and 10 percent of those with a limiting need who intend to use will not adopt contraception. Model 4 also assumes as does Model 3 that those women in need who do not intend to use because they feel unexposed to risk will not use. And, finally, this model assumes that half (also arbitrary) of the remaining women in need who do not intend to use will in fact use. This set of assumptions for Model 4 yields a fertility reduction between that for Models 2 and 3, but closer to that for Model 2. It is therefore a conservative estimate.

The hypothetical total demand estimates for the four models initially are calculated separately for the spacing and limiting components of unmet need and then are aggregated. The reason is to permit first adjusting the unmet need downward as proposed by Bongaarts (1991), which seems to be an appropriate adjustment for assessing the demographic significance of unmet need.[17] Based on Bongaarts' calculations, the adjustment for spacing need is a 30 percent reduction but for limiting need it is only 3 percent. The rationale for this spacing need adjustment is that spacers will at some point in the near future discontinue contraceptive practice in order to have another child. Therefore, the estimated demand for family planning as a current status estimate would exaggerate the steady-state effect of satisfying the unmet need for spacing.[18]

The "correction" of the unmet need for limiting, which has also been incorporated into all models, is based on Bongaarts' argument that a cohort's period of exposure to the need for contraception to limit fertility will diminish as the need for spacing is satisfied, because the women will have stretched out the time required to reach their desired number of children and thus have fewer remaining years of exposure to the risk of an unwanted birth. The downward adjustment for this category is only 3 percent and could easily be ignored both because of its magnitude and because the hypothetical effect is over a longer period of time. Nonetheless, it has been taken into account.

[17] The adjustment is appropriate for calculations of the hypothetical effect on fertility. For other uses of data on unmet need, such as those utilized by program managers, the appropriate statistic is the unadjusted unmet need presented in the earlier tables (Westoff, response to Bongaarts, 1992).

[18] The current CPR is unaffected by this consideration since it already reflects the net balance of entries and exits from the use for spacing purposes.

11.2 ESTIMATED TOTAL DEMAND UNDER DIFFERENT ASSUMPTIONS

The estimated total demand[19] for family planning implied by the satisfaction of unmet need under the four different assumptions shows a considerable range. The greatest increase in total demand is for Model 1, which assumes (following the Bongaarts adjustment) that all unmet need is satisfied. The hypothetical gains in the CPR that would be realized are considerable (Table 11.1 and Figure 11.1). For example, the CPR of Burkina Faso would increase from the current 8 to 33; of Rwanda, from 21 to 50; and of Pakistan from 12 to 38. The implied increases are considerable in the more developed countries as well, e.g., the CPR in Egypt would rise from 47 to 66, in Morocco from 41 to 58, in the Philippines from 40 to 62 and in Peru from 59 to 73. The average CPR in sub-Saharan Africa would rise from 15 to 37; the corresponding increase in countries outside that region, excluding Pakistan, is from 50 to 65 percent.

However, these estimated increases from Model 1 are too high because these calculations assume that all current unmet need can be satisfied.[20] A very conservative alternative is captured in Model 2, which assumes that only women in need who intend to use a method will become users. This has the effect, as noted earlier, of removing an average of nearly half of women in need. This model shows the smallest increases in expected use but there are appreciable gains nonetheless. Use in Ghana would rise from 20 to 38 percent, in Kenya from 33 to 53, in Malawi from 13 to 32. Under this assumption, the CPR in Jordan would increase from 40 to 48, in Bangladesh from 45 to 56, and in Colombia from 66 to 73 percent.

The two remaining models show results between those of Models 1 and 2. Model 3, which removes only the unexposed women in need from those who do not intend to use, shows a hypothetical increase from an average current CPR of 15 to an expected average of 36 percent in the sub-Saharan countries. In the other countries (excluding Pakistan) the CPR increases from an average of 50 to 64 percent.

Model 4, which is designed to be the most realistic estimate of the potential reduction of unmet need, also shows appreciable expected increases in the demand for family planning although not quite as high as Model 3. For example, the CPR in Madagascar could rise from 17 to 36, in Namibia from 29 to 41, in Nigeria from 6 to 16, and in Zambia from 15 to 31. Elsewhere, the increases expected are more modest: from 63 in Turkey to 69, from 50 in Indonesia to 57, from 45 to 56 in Bangladesh and from 56 to 67 percent in the Dominican Republic.

In sub-Saharan Africa the rise would be from the average CPR of 15 to 30 percent. In the other countries (excluding Pakistan), the corresponding increase would be from 50 to 60 percent.

Table 11.1 Estimates of demand for family planning: Four models

Estimates of the potential demand for family planning under four different assumptions of the amount of unmet need satisfied, Demographic and Health Surveys, 1990-1994

Country	Current contraceptive use	Potential demand estimated if need satisfied			
		Model 1	Model 2	Model 3	Model 4
SUB-SAHARAN AFRICA					
Burkina Faso	7.9	33.0	16.9	29.9	21.9
Cameroon	16.0	32.4	23.6	31.9	26.5
Ghana	20.3	45.9	38.1	44.6	38.4
Kenya	32.8	61.1	53.1	59.9	53.4
Madagascar	16.7	43.5	34.1	42.8	36.0
Malawi	13.0	40.4	32.5	38.8	32.2
Namibia	28.9	45.9	37.7	45.3	40.1
Niger	4.5	18.2	9.9	17.2	12.5
Nigeria	5.9	22.4	12.3	22.2	16.3
Rwanda	21.1	50.4	43.9	49.3	42.9
Senegal	7.4	29.6	18.5	29.0	21.8
Sudan (Northern)	8.7	28.5	15.7	25.8	24.3
Tanzania	10.4	31.7	20.4	30.4	23.7
Zambia	15.2	38.8	30.8	36.8	31.2
NEAR EAST/NORTH AFRICA					
Egypt	47.1	66.4	57.9	62.8	59.0
Jordan	40.0	58.5	48.2	55.1	50.4
Morocco	41.5	58.3	50.7	57.3	52.7
Turkey	62.6	72.5	68.7	70.7	69.0
ASIA					
Bangladesh	44.8	59.5	56.3	58.7	55.8
Indonesia	49.7	61.2	54.7	60.2	56.7
Pakistan	11.9	38.1	19.0	36.2	26.7
Philippines	40.0	61.6	48.5	59.2	52.7
LATIN AMERICA/CARIBBEAN					
Bolivia	45.3	66.6	56.9	65.4	59.8
Colombia	66.1	76.2	73.5	75.5	73.5
Dominican Republic	56.4	70.6	66.3	70.0	66.6
Paraguay	48.4	60.9	54.2	59.8	56.1
Peru	59.0	73.1	69.1	72.7	69.7

[19] "Total demand" is defined for this purpose as the simple sum of contraceptive prevalence and unmet need. This is the same definition used (see Table 4.2) for the sub-Saharan countries, but it differs for other countries in that it does not include the contraceptive failures of pregnant and amenorrheic women. The reason for excluding these failures in the demand estimated for this fertility analysis is that a measure of future contraceptive prevalence is needed that is consistent with the measure of prevalence used in other national surveys, which is the basis for the regression analysis of the TFR on the CPR.

[20] There will be rapid increases in the proportions of women wishing to control their fertility which may cause temporary increases in unmet need. At a certain stage of the transition, unmet need is a rapidly moving target because demand is outpacing supply.

Figure 11.1 Estimates of the demand for family planning under two assumptions of the satisfaction of unmet need, Demographic and Health Surveys, 1990-1994

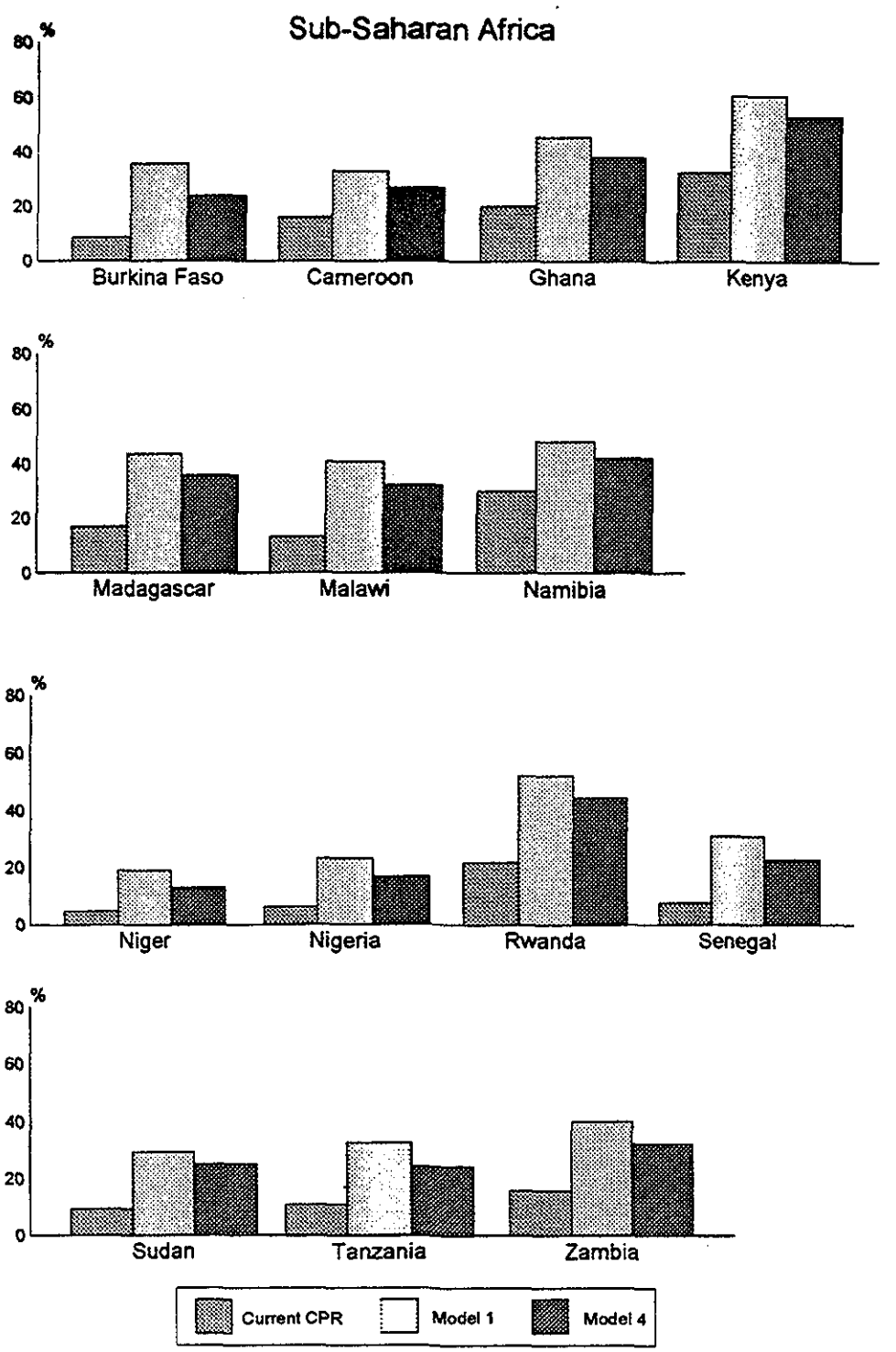
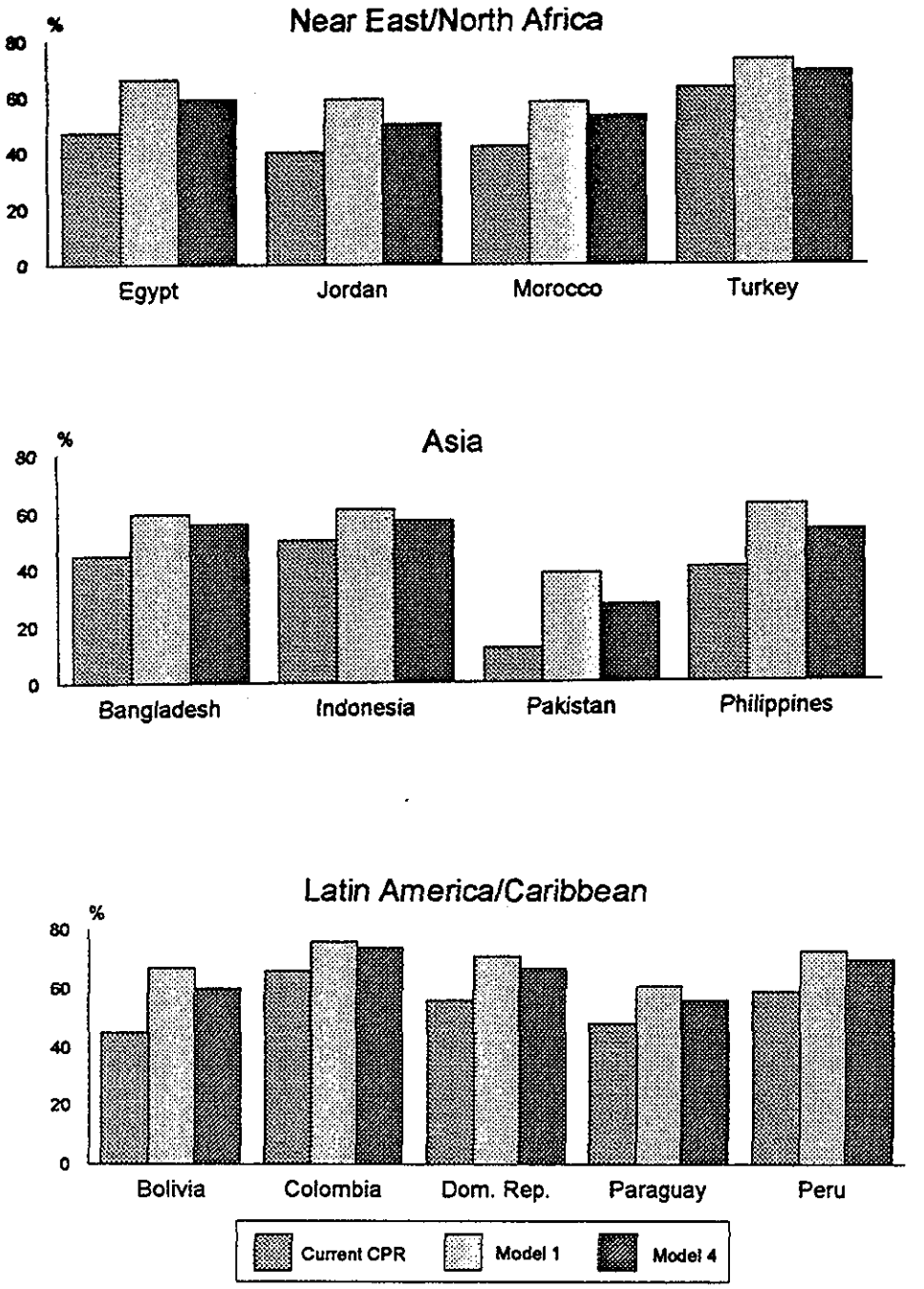


Figure 11.1—*Continued*



11.3 METHODOLOGY FOR ESTIMATING THE IMPLIED FERTILITY REDUCTION

The next question, given the estimates of demand if unmet need is satisfied, is "What would be the effect on the fertility rate?" The logic of the procedure followed is to exploit the strong correlation between contraceptive prevalence and the fertility rate that has been documented repeatedly across countries.

A collection of the most recent national survey estimates of these two parameters for 86 different countries has been assembled; the correlation between contraceptive prevalence (CPR) and the total fertility rate is 0.94. The regression equation used by the authors for estimating the TFR from the predicted new contraceptive prevalence rate is:

$$TFR_i = 7.178 - 0.0682\ (CPR_i) + e_i$$

where the CPR_i is the potential total demand for the individual country, i.e., the observed percentage of married women currently using contraception plus the percentage expected from satisfying unmet need under the different assumptions of the four models.

There is one complication that arises from the fact that although the correlation between the CPR and the TFR is very high, it is not perfect. The unexplained variance (around 12 percent) stems both from the operation of other unrepresented variables that affect fertility, for example, age at marriage, postpartum insusceptibility and abortion, and from errors of measurement of both of the main variables. The TFR is subject to errors of both displacement and omission of births (Curtis and Arnold, 1994) and contraceptive practice can be misreported as well although its characteristic errors are less understood. Also, the time junctures of the two measurements are imprecise. Although the CPR is a current status measure, the fertility rate is based on the three-year or five-year period before the interview. One consequence of these different factors is that the simple inclusion of the estimated demand into the regression equation can occasionally predict a fertility rate higher than the observed current rate. One example is Sudan,[21] with an observed TFR of 4.6 and a predicted rate of 5.2 based on Model 1 (the model that yields the greatest reduction estimate). In the case of Sudan there is the anomaly of a low TFR and a very low CPR of 8.7 percent. The extent of this apparent inconsistency can be appreciated by estimating the CPR that would theoretically be expected with the observed TFR of 4.6, which is 37 percent. The TFR expected with a CPR of 8.7 percent is 6.5. The TFR in Sudan has declined precipitously and sharp increases in age at marriage and age at first birth have played a major role. Other factors may be at work as well, including the possibility of underreporting of births. In any event, it is clear that determinants other than contraceptive practice are at work here.

There are a few other anomalies among the more than 100 estimates of fertility based on the four models of unmet need reduction; these occur for Model 2 for Nigeria and for Pakistan. Both of these countries have apparent problems with the accuracy of the reporting of recent births. In Pakistan, the observed recent decline in fertility was shown on reinterview to be largely due to the omission of births (Curtis and Arnold, 1994).

It is obvious that any reduction of unmet need by the substitution of contraception will not result in an increase in the fertility rate.[22] This problem has been essentially resolved by estimating the TFR that would be implied by the various models if all observations lay on the regression line. In effect, this eliminates the residuals and implies that contraceptive practice is a perfect predictor of fertility. Stated differently, it implies that all of the variance of fertility is determined by the variance of contraceptive practice. The procedure followed is first to calculate the estimated total demand for family planning under the four different models (shown earlier in Table 11.1). The second step is to derive from the regression equation the TFR that would be associated with these new estimated prevalence rates. In order to circumvent the anomalies described above, these estimated TFRs are then adjusted by adding the residuals obtained as the difference between the observed TFR and the TFR predicted by the current CPR. In effect, this removes the deviations from the straight line and indicates the TFR that would be realized if contraceptive prevalence were the only determinant. The adjusted TFRs for the four models are shown in Table 11.2 (see also Figure 11.2) and the derived percentage declines appear in Table 11.3.

11.4 THE FERTILITY IMPLICATIONS

Given the observed potential demand for family planning in Model 1 (revised downward only by the Bongaarts adjustment), which assumes that *all* unmet need would be satisfied, the implied reductions in fertility would be considerable. This maximum assumption would reduce the TFR in sub-Saharan Africa from an average of 6.1 to 4.6. The potential decline would be greatest in Kenya (36 percent), which has already experienced a rapid recent decline in fertility; the smallest reduction would be in Niger where even if all existing unmet need were satisfied, the estimated reduction would be only 13 percent. In other regions, the Philippines and Pakistan would realize large reductions as would the Dominican Republic. On average, the maximum effect (Model 1) for all countries considered indicates a reduction of 27 percent in the TFR; the minimum reduction in Model 2 is 15 percent.

In Model 3, which excludes from potential use only those women in need who do not intend to use because they do not think they are exposed to the risk of pregnancy, the results are quite similar to those for Model 1, i.e., an average reduction of 24 percent.

[21] Only northern Sudan was included in the survey.

[22] One possible exception would be the replacement of abstinence with imperfect methods.

Table 11.2 Total fertility rates associated with estimates of the demand for family planning

Total fertility rates associated with four estimates of the demand for family planning, Demographic and Health Surveys, 1990-1994

Country	Current TFR	TFR implied by CPR	TFR estimated if unmet need satisfied			
			Model 1	Model 2	Model 3	Model 4
SUB-SAHARAN AFRICA						
Burkina Faso	6.9	6.6	5.2	6.3	5.4	6.0
Cameroon	5.9	6.3	4.6	5.2	4.6	5.0
Ghana	5.5	4.9	4.6	5.2	4.7	5.1
Kenya	5.3	4.9	3.4	3.9	3.5	3.9
Madagascar	6.1	6.3	4.0	4.7	4.1	4.5
Malawi	6.7	6.3	4.8	5.4	4.9	5.4
Namibia	5.6	5.2	4.4	5.0	4.5	4.8
Niger	7.4	6.9	6.4	7.0	6.5	6.8
Nigeria	6.0	6.8	4.9	5.6	4.9	5.3
Rwanda	6.2	5.7	4.2	4.6	4.3	4.7
Senegal	6.0	6.7	4.5	5.2	4.5	5.0
Sudan (Northern)	4.7	6.6	3.4	4.2	3.6	3.7
Tanzania	6.2	6.5	4.7	5.5	4.8	5.3
Zambia	6.5	6.2	4.9	5.4	5.0	5.4
NEAR EAST/NORTH AFRICA						
Egypt	3.9	4.0	2.6	3.2	2.8	3.1
Jordan	5.6	4.8	4.0	4.7	4.2	4.5
Morocco	4.2	4.3	3.1	3.6	3.2	3.5
Turkey	2.5	2.9	1.9	2.1	2.0	2.1
ASIA						
Bangladesh	3.4	4.1	2.4	2.6	2.5	2.7
Indonesia	3.0	3.8	2.2	2.7	2.3	2.5
Pakistan	5.4	6.4	3.6	4.9	3.7	4.4
Philippines	4.1	4.5	2.6	3.5	2.8	3.2
LATIN AMERICA/CARIBBEAN						
Bolivia	4.8	4.1	3.3	4.0	3.4	3.8
Colombia	2.9	2.7	2.2	2.4	2.3	2.4
Dominican Republic	3.3	3.4	2.3	2.6	2.3	2.6
Paraguay	4.7	3.9	3.8	4.3	3.9	4.1
Peru	3.5	3.2	2.5	2.8	2.6	2.8

TFR = Total fertility rate
CPR = Contraceptive prevalence

Figure 11.2 Total fertility rates associated with increases in demand for family planning under two assumptions, Demographic and Health Surveys, 1990-1994

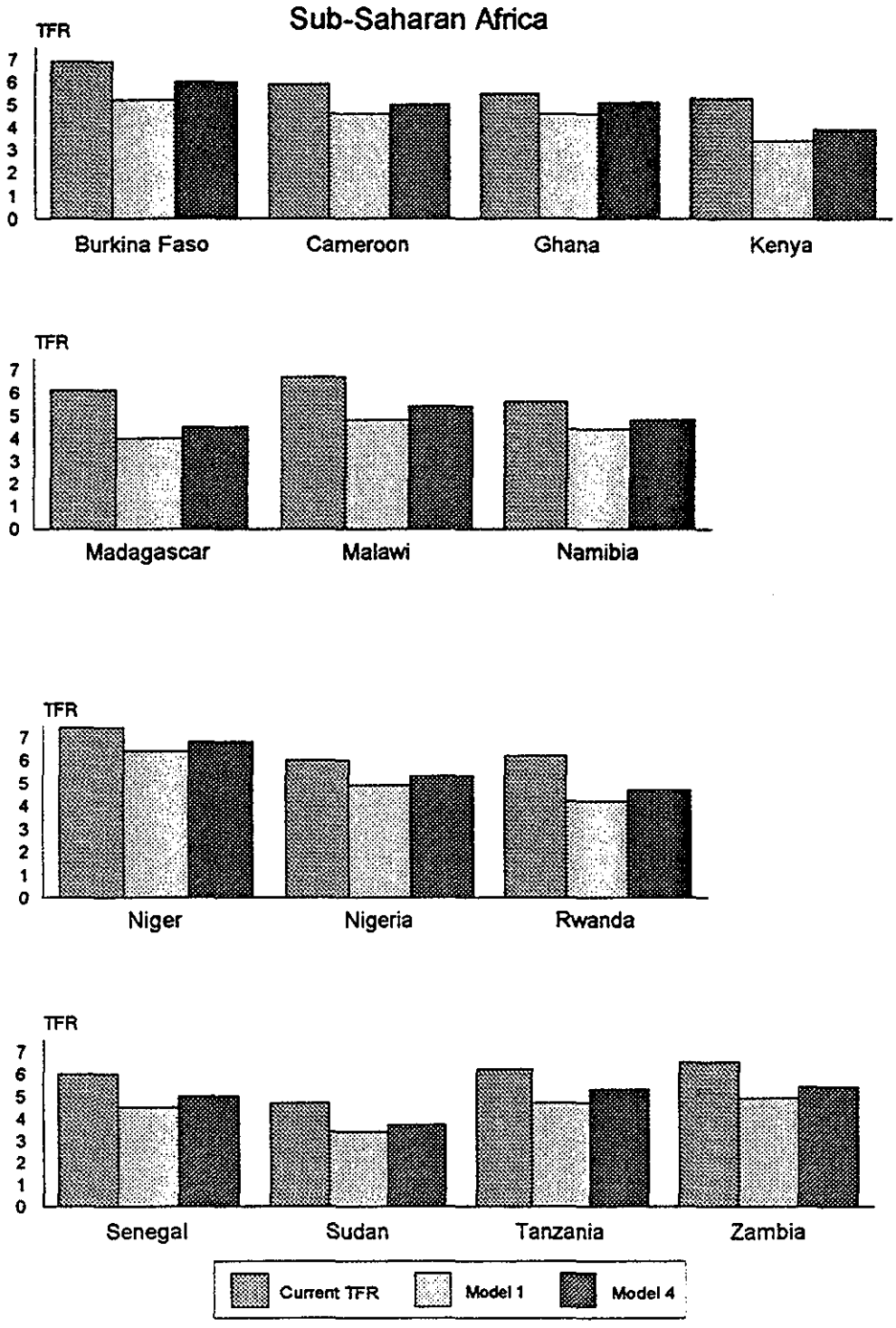


Figure 11.2—*Continued*

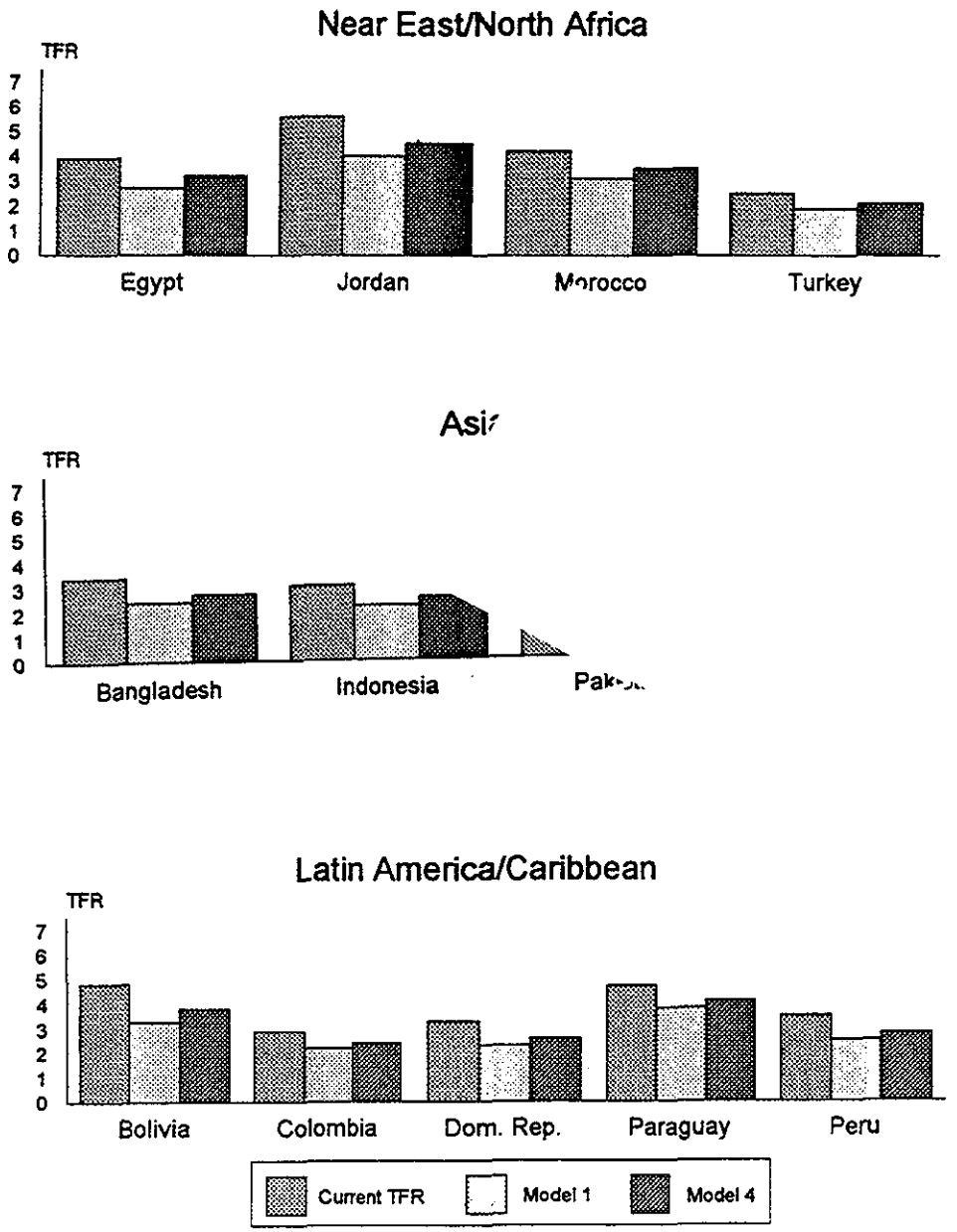


Table 11.3 Reductions in total fertility rate implied by the satisfaction of unmet need: Four models

Percent reduction of the total fertility rate implied by the satisfaction of unmet need under different assumptions, Demographic and Health Surveys, 1990-1994

Country	Model 1	Model 2	Model 3	Model 4
SUB-SAHARAN AFRICA				
Burkina Faso	24.7	8.8	21.6	13.7
Cameroon	22.4	12.3	21.8	15.6
Ghana	16.0	6.3	14.4	6.7
Kenya	36.2	25.9	34.6	26.2
Madagascar	34.1	23.6	33.3	25.7
Malawi	27.9	19.8	26.3	19.5
Namibia	20.6	10.6	19.8	13.5
Niger	13.1	5.4	12.2	7.8
Nigeria	18.6	7.2	18.4	11.7
Rwanda	32.3	25.2	31.1	24.1
Senegal	25.7	13.1	25.0	16.8
Sudan (Northern)	28.3	9.7	24.4	22.2
Tanzania	23.9	11.4	22.4	15.1
Zambia	25.0	16.6	22.9	17.0
NEAR EAST/NORTH AFRICA				
Egypt	33.9	19.1	27.6	21.0
Jordan	28.6	16.1	24.5	18.8
Morocco	26.5	14.1	24.8	17.4
Turkey	25.9	15.5	21.0	16.4
ASIA				
Bangladesh	28.7	22.3	27.1	21.3
Indonesia	25.5	10.7	23.2	15.2
Pakistan	33.0	8.8	30.6	18.6
Philippines	35.9	14.1	31.9	21.1
LATIN AMERICA/CARIBBEAN				
Bolivia	30.3	16.5	28.6	20.6
Colombia	24.0	17.6	22.3	17.6
Dominican Republic	30.2	21.3	28.9	21.9
Paraguay	18.7	9.0	17.1	11.8
Peru	27.5	19.7	26.7	20.8

The most likely set of assumptions in Model 4 indicates an average TFR reduction across all countries of 18 percent. For sub-Saharan Africa, this average is essentially the same, 17 percent.

Another perspective on the extent to which fertility would be reduced by the satisfaction of unmet need is the proportion of the distance to the replacement level that would result. With the Model 4 assumptions, the TFR in Kenya would decline from 5.3 to 3.9. This decline of 1.4 represents 44 percent of the distance to replacement (1.4/5.3 - 2.1).[23] This calculation is shown in Figure 11.3 for all of the countries. In Turkey, if unmet need were satisfied with the criteria of the conservative Model 4, the TFR would reach replacement covering all (100 percent) of the distance from the current TFR of 2.5. In some other countries where current fertility is also relatively low, such as Colombia, the Dominican Republic and Peru, the satisfaction of unmet need would also have substantial effects on narrowing the distance to replacement (62, 58 and 50 percent, respectively). In Bangladesh and Indonesia, the elimination of unmet need would also result in reducing the distance to replacement by more than 50 percent. In sub-Saharan Africa, the average effect would be to cover one-quarter of the way to replacement. These estimates indicate that significant demographic effects could be realized by the reduction of unmet need even with the conservative assumptions incorporated into Model 4.

[23] The value of 2.1 is an approximation of the TFR required for replacement. The actual level may be slightly higher for countries with higher mortality rates.

Figure 11.3 Percent of the distance to replacement fertility that would result from satisfying unmet need (Model 4), Demographic and Health Surveys, 1990-1994