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BIRTH SPACING AND LIMITING CONNECTIONS

DHS ANALYTICAL STUDIES 21



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MEASURE DHS assists countries worldwide in the collection and use of data to monitor and evaluate population, health, and nutrition programs. Additional information about the MEASURE DHS project can be obtained by contacting MEASURE DHS, ICF Macro, 11785 Beltsville Drive, Suite 300, Calverton, MD 20705 (telephone: 301-572-0200; fax: 301-572-0999; e-mail: reports@measuredhs.com; internet: www.measuredhs.com).

The main objectives of the MEASURE DHS project are:

- to provide decisionmakers in survey countries with information useful for informed policy choices;
- to expand the international population and health database;
- to advance survey methodology; and
- to develop in participating countries the skills and resources necessary to conduct high-quality demographic and health surveys.

DHS Analytical Studies No.21

Birth Spacing and Limiting Connections

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Contents

List of Tables	iv
List of Figures	v
Preface.....	vii
Executive Summary	ix
1. Objective	1
2. Methodology	1
3. Measurement of the Desired Number of Children.....	2
4. Number of Children at First Use of Contraception.....	3
5. Comparisons with Earlier Measurement.....	8
6. Estimates of the Spacer-Limiter Transition	8
7. Trends in the Transition	11
8. Differences between the Two Types of Limiters.....	16
9. Method Use	23
10. Multivariate Analyses	25
11. The Effect of Spacing Experience on Desired Family Size.....	26
12. Discussion	37
Appendix	38

List of Tables

Table 1.	Percentage of currently married women who are currently using a method for spacing or for limiting, and the percentage of Limiters who had formerly been Spacers or had only been Limiters.	9
Table 2.	Differences in characteristics among Limiters with no former spacing experience and those with spacing experience.	17
Table 3.	Percentage of current Limiters using a modern method and the main method used by Limiters only compared with Limiters who had formerly been Spacers.	23
Table 4.	Odds ratios of Limiters having been Spacers, by region.	26
Appendix	Percent distribution of two measures of number of children desired by married women using contraception who want no more children.	38

List of Figures

Figure 1.	Percentage of ever-married women who first used a contraceptive method before the third child.	
	Asia and North Africa.	4
	Latin America and the Caribbean.....	5
	Western and Middle Africa	6
	Eastern and Southern Africa.....	7
Figure 2.	Percentage of Limiters who previously used contraception for spacing.	
	Asia and North Africa.	12
	Latin America and the Caribbean.....	13
	Western and Middle Africa	14
	Eastern and Southern Africa.....	15
Figure 3.	Percentage of last births in the past five years that were unwanted among Limiters with (LS) and without (LO) earlier spacing experience.	
	Asia and North Africa.	19
	Latin America and the Caribbean.....	20
	Western and Middle Africa	21
	Eastern and Southern Africa.....	22
Figure 4.	Mean number of children desired by married women by current contraceptive use and spacing and limiting status.	
	Asia and North Africa.	28
	Latin America and the Caribbean.....	29
	Western and Middle Africa	30
	Eastern and Southern Africa.....	31
Figure 5.	Trends in the current use of contraception for spacing and for limiting births, for currently married women age 15–49.	
	Asia and North Africa.	32
	Latin America and the Caribbean.....	33
	Western and Middle Africa	34
	Eastern and Southern Africa.....	35

Preface

One of the most significant contributions of the MEASURE DHS program is the creation of an internationally comparable body of data on the demographic and health characteristics of populations in developing countries.

The *DHS Comparative Reports* series examines these data across countries in a comparative framework. The *DHS Analytical Studies* series focuses on analysis of specific topics. The principal objectives of both series are to provide information for policy formulation at the international level and to examine individual country results in an international context.

While *Comparative Reports* are primarily descriptive, *Analytical Studies* comprise in-depth, focused studies on a variety of substantive topics. The studies are based on a variable number of data sets, depending on the topic being examined. A range of methodologies is used in these studies including multivariate statistical techniques.

The topics covered in *Analytical Studies* are selected by MEASURE DHS staff in conjunction with the U.S. Agency for International Development.

It is anticipated that the *DHS Analytical Studies* will enhance the understanding of analysts and policymakers regarding significant issues in the fields of international population and health.

Ann Way
Project Director

Executive Summary

Contraception can be used both for the spacing and for the limiting of births. The main thrust of family planning programs in developing countries has been to promote the use of family planning use to enhance the health of mothers and of their children. In sub-Saharan Africa, the proportion of women using contraception for spacing almost universally exceeds the proportion using for limiting their number of births. Because contraceptive use for birth limitation is the driving force to reduce high rates of population growth, the question that arises is whether the use for spacing leads to the use for limiting. Does spacing behavior eventually result in a desire for fewer births?

The measurement of this connection between spacing behavior and limiting births is less than straightforward with cross-sectional data. Ideally, the analysis would estimate the probability that birth spacing lowers the number of children desired which, in turn, increases birth limiting. In the absence of longitudinal data, the indicator developed here is confined to estimating the proportion of Limiters who had formerly been Spacers. An algorithm was constructed based on the parity at first use of a method in combination with the total number of children desired.

The number of children that people have when they first begin contraceptive use is clearly declining and in some countries this trend is striking.

Estimates of the proportion of Limiters who had been Spacers are presented for 51 developing countries in the DHS program. In the DHS countries of Asia, North Africa, Latin America and the Caribbean, an average of two-thirds of current Limiters had formerly been Spacers. In Western and Middle Africa, about the same proportion of Limiters had been Spacers, though there are only small proportions of Limiters to begin with (mostly in single digits). In Southern and Eastern Africa with larger proportions of Limiters, the fraction of former Spacers averaged 20 percent. Altogether, 34 of the 51 countries show at least half of Limiters with earlier spacing experience. An analysis of trends in the proportion shows a pattern of increase in Asia and North Africa but such evidence is weak or non-existent elsewhere.

Examination of the difference between Limiters with and without prior spacing experience shows a clear difference between the two in the proportion of recent unwanted births. In 47 countries there is a consistently higher proportion of unwanted last births among Limiters with no previous spacing experience. Surprisingly there is no evidence of shifts in method use as Spacers become Limiters. Examining the differences between Limiters with and without a spacing background in a multivariate context shows that Limiters who had been Spacers, in addition to being less likely to have had unwanted births, are less likely to have experienced the death of a child, are more likely to have higher levels of education and are more likely to have been exposed to mass media.

In brief, significant proportions of women who currently limit their fertility were Spacers in the past, though there is no direct evidence that spacing experience reduces the number of children desired. There is evidence that birth spacing reduces child mortality, a finding that is consistent with other research in this area.

1. Objective

Contraception is used both to prolong the length of birth intervals and to terminate childbearing. In the least developed countries, the use for spacing predominates, motivated in major part by concerns about the health of mothers and children. Contraceptive use for limiting is less evident in high fertility populations because desired family size is high. These two modes of contraceptive practice have very different implications for the fertility rate with the use for limiting showing a much higher correlation with the total fertility rate than the use for spacing (accounting for 76 percent and 14 percent of the variance of the TFR respectively across 62 developing countries).¹

The main focus of this research is to examine the extent to which the use of contraception for spacing leads to its use for limiting. That transition can occur either with the passage of time and the continuation of contraceptive practice or else can occur sooner if the early experience of controlling fertility leads to actually wanting fewer children. Note that while we define a Limiter as a woman using contraception after she has reached her desired number of children, it is also possible for a woman to want no more children, and therefore be a Limiter, even though her ideal number of children has not been attained. An example of this might be a woman who is limiting births to protect her own health status. This is a particularly important question for countries in sub-Saharan Africa where organized family planning programs are largely focused around reproductive and child health rationales with an emphasis on birth spacing. Because there is also concern about very high fertility rates and population growth in many of these countries, it is important to learn the extent to which use for spacing carries over to use for limiting. This relates to the more general question of whether supply generates demand, a topic of recurring interest in family planning policy.

2. Methodology

The Demographic and Health Surveys project is the source of data in this analysis. Spacers are women using a method who want to wait two or more years before having their next child while Limiters are women who are using a method to avoid the birth of any more children. Since the DHS questionnaire does not include a full contraceptive history or a direct dating of when the woman first wanted no more births, the sequence cannot be measured directly but an indirect approach has been developed. The algorithm is based on the number of children at first use of contraception which is asked of all women who have ever used a method. This information is then combined with the number of children currently desired (its measurement is described below) to determine whether or not Limiters had used a method before they reached the total number desired.

To illustrate: a Limiter (a woman currently using a method who wants no more children) who wants a total of four children but had first used a method before she had her fourth child is classified as a Limiter who earlier had been a Spacer. In contrast, if she had not used a method until she had four or more children, she would be classified as a Limiter without prior spacing experience. It is then possible to estimate the proportion of Limiters who earlier had been Spacers compared with those who first used contraception for limiting. Ideally, it would be preferable to estimate the probability of a Spacer becoming a Limiter but data limitations only permit the reverse estimation of the proportion of Limiters who had been Spacers. This is a shortcoming that only a longitudinal design can overcome.

¹ These estimates are based on calculations from DHS data for different countries.

3. Measurement of the Desired Number of Children

Two different though related measures of the number of children desired have been evaluated. As noted above, establishing the number of children desired is necessary to determine whether the first use of contraception preceded the total number desired or had occurred later. The objective is to select a measure of the desired number of children for married women who are classified as Limiters, i.e. women currently using a method to avoid further childbearing. These are the women classified as “Using to Limit” in the standard Unmet Need measure.

The first possibility is the standard number of children desired measure, also known as the “Ideal” number of children. The second possibility is the actual number of children minus any recent birth reported as unwanted. To reiterate: both of these measures are applied to women currently using a method who want no more children (Limiters). One problem with the first measure is that there are some women who provide non-numeric responses to the Ideal number question such as “It’s up to God” or “Whatever number comes” or “Don’t know.” Although the proportion of women with such responses has declined over recent years, there remain countries primarily in sub-Saharan Africa, where the number of such answers is not insignificant, for example Mali with 14 percent of Limiters in this category. The average in sub-Saharan Africa is five percent and less than three percent in other regions. This shortcoming can be adjusted by substituting numerical values to such responses from the second measure, the actual number of children minus unwanted births. In practice, the only unwanted birth involved in the second approach is the last birth in the preceding five years which implies some overestimate of total wanted fertility in the second measure.

The mean number of children wanted for Limiters in sub-Saharan Africa is 4.6 for both measures. In other regions, the mean number for the Ideal measure is 2.9 and for the second measure is 3.2. The average correlation between the two measures, 0.44 in sub-Saharan Africa and 0.43 in other regions, indicates a moderate positive association. The important question is the extent of the differences between the two measures in the estimated proportions of women who began contraceptive practice as Limiters and the proportions who had begun as Spacers and subsequently became Limiters. In the aggregate, however, the average difference amounts only to about 2 percent.

Finally, there is another difference between the two measures in the heaping of responses which argues for use of the second approach (Appendix A). With the Ideal measure, there is considerable heaping at four children in sub-Saharan Africa and at two children in other countries. With the second measure, the heaping is significantly lower. The second measure is the one selected for most of the following substantive analyses.

4. Number of Children at First Use of Contraception

The other main datum needed to estimate the prior spacing record of Limiters is the number of children at the time a method was first used. Aside from its use for this purpose, parity at first use is an indicator of the general trend of family planning and its demographic importance. To summarize recent trends, the cumulative proportion of ever-married women that first used a method before a third birth – an indicator that in the less developed countries is largely of spacing behavior – is depicted in Figure 1 for countries that have conducted several surveys. The overall pattern of an increasing proportion first using contraception before the third birth is very clear and in some countries very strong. In sub-Saharan Africa, this trend is clear mainly in Eastern and Southern countries.

The age of women at the first use of contraception can be derived from the parity at first use. It is estimated here for married women who have ever used a method. It shows little international variation and an average of 22-23 years of age. Because this will be affected by age at marriage, an estimate of the interval between age of first use and first marriage has been calculated which shows a range of 1.2 for Colombia to 8.0 for Ethiopia with an average interval of 3-4 years. Ghana and Kenya show an interval averaging about 4 years.

Figure 1. Percentage of ever-married women who first used a contraceptive method before the third child: Asia and North Africa.

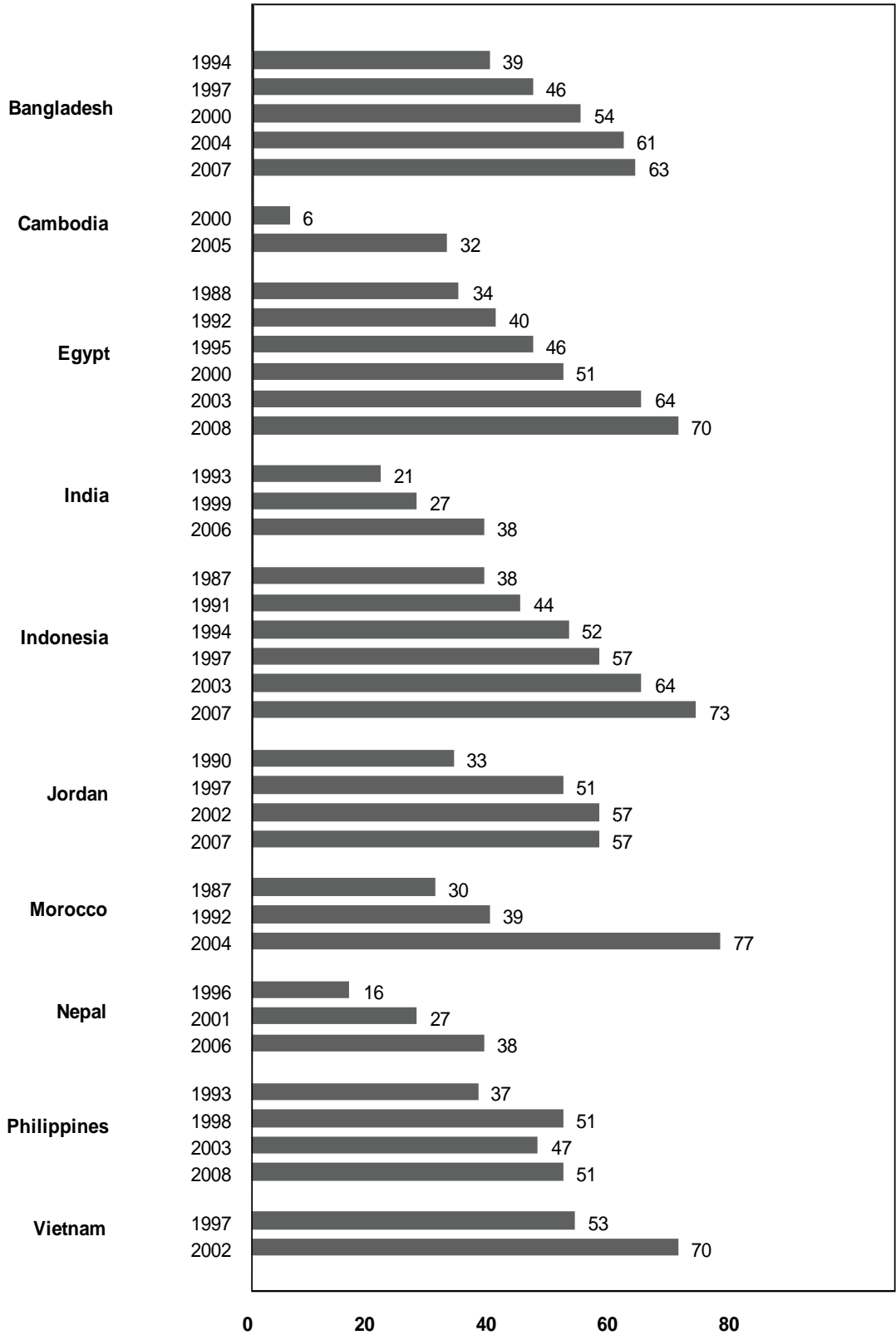


Figure 1 (continued). Percentage of ever-married women who first used a contraceptive method before the third child: Latin America and the Caribbean.

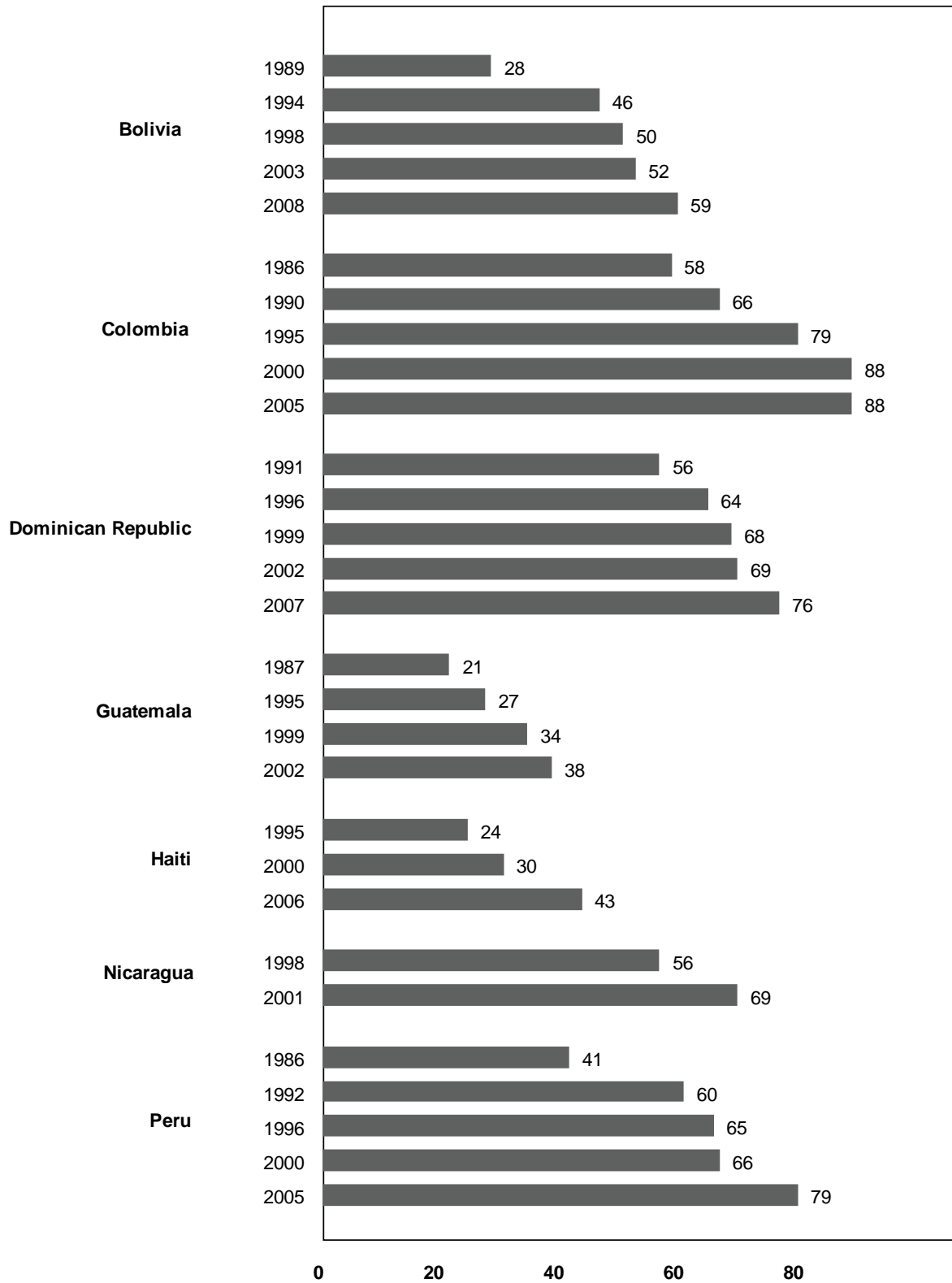


Figure 1 (continued). Percentage of ever-married women who first used a contraceptive method before the third child: Western and Middle Africa.

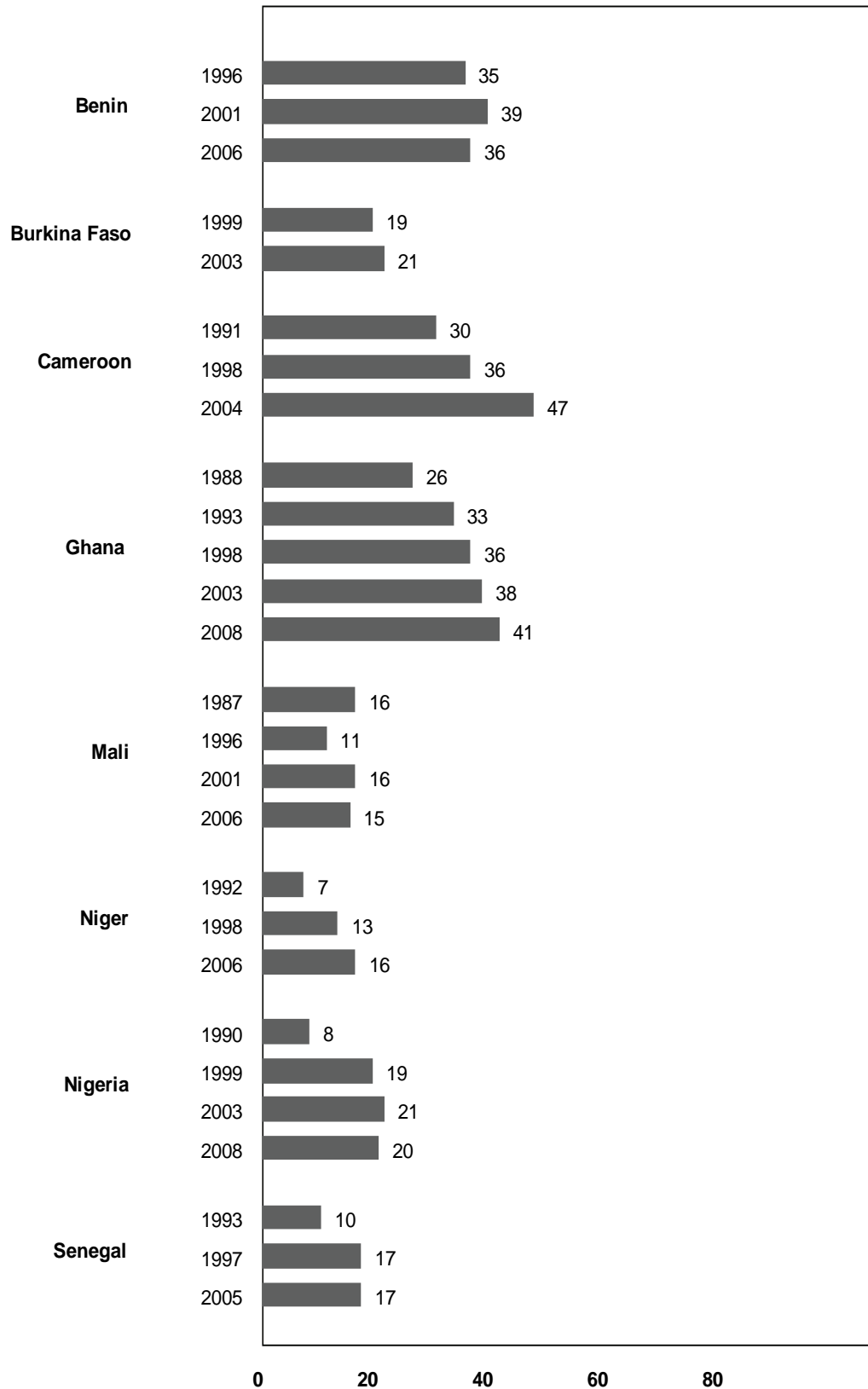
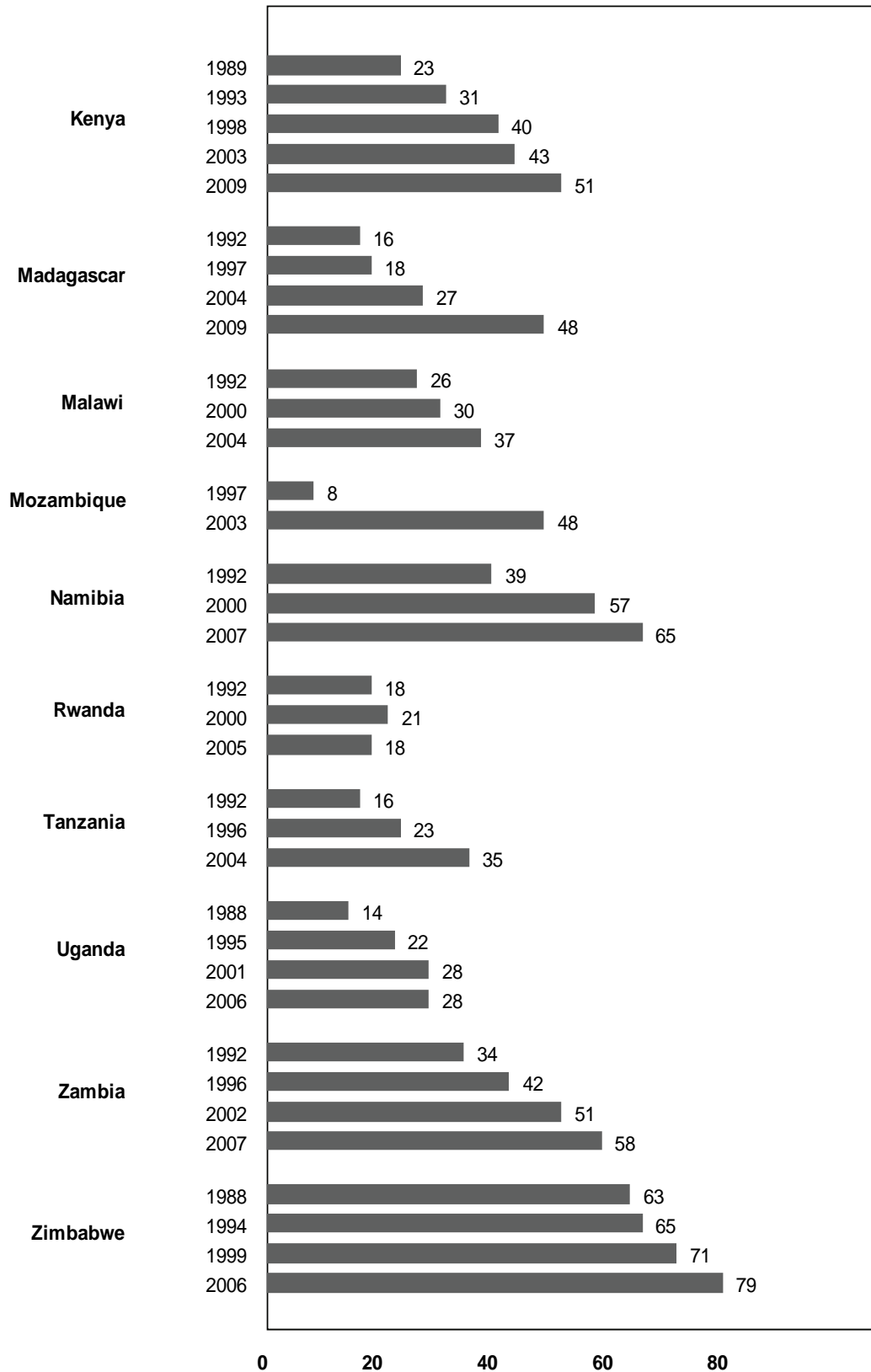


Figure 1 (continued). Percentage of ever-married women who first used a contraceptive method before the third child: Eastern and Southern Africa.



5. Comparisons with Earlier Measurement

In Demographic and Health Surveys conducted in the 1990s, some countries included a direct question of women who had ever used a contraceptive method to estimate the spacing - limiting distinction that the algorithm described above strives to do: "When you first used family planning, did you want another child but at a later time, or did you not want to have another child at all?" This question was discontinued in later surveys but its earlier inclusion in some surveys permits a comparison of this direct approach with the indirect method developed here. The results of this comparison for eight countries show very similar distributions with an average difference below 5 percent.

6. Estimates of the Spacer-Limiter Transition

The main objective of this study is to estimate the proportion of Limiters that had formerly been Spacers (L-S). This proportion is based on the two measures described above: the number of children wanted and the parity at first use of a contraceptive method. Estimates of the distribution of this proportion appear in columns 3 and 4 of Table 1. There is a considerable amount of international variation in L-S, ranging from a low of 24 percent in India to a high of 89 percent in Morocco. The overall average for this region is 57 percent. It is important to keep in mind that L-S is a percentage of Limiters which are only a small fraction of all married women, especially in Western and Middle Africa where, on average, only 5 percent are current Limiters (column 2 in Table 1) with half of these women in the L-S category. In India, sterilization is by far the main contraceptive method used by currently married women (38 percent) with 77 percent of those sterilized not having used any prior method. Nearly all contraceptive prevalence in India is for limiting. In Morocco and Jordan, slightly over 60 percent of prevalence is for limiting. In general, in regions other than those in sub-Saharan Africa, the overall use for limiting is two to three times greater than the use for spacing (columns 1 and 2 of Table 1). Trends in spacing and limiting are shown in Figure 5 at the end of this report.

The Latin American and Caribbean picture is fairly similar to that in Asia and North Africa, with an estimated average of 66 percent of Limiters who had been Spacers. Haiti and Bolivia have a lower percentage while Colombia shows the highest percentage in the L-S category.

In sub-Saharan Africa, particularly in the Western and middle region, the use for spacing (columns 1 and 2 in Table 1) predominates with the use for limiting below 10 percent in every country except Ghana. On average, around half of these Limiters began use as Spacers (column 3) but as noted above this means only a very small fraction of married women in general. The range of the L-S estimates is from a low of about one-third in Liberia, Sierra Leone and Guinea to around two-thirds in Gabon, Benin, Cameroon and several other countries.

In contrast with this region of Africa, the countries in the Southern and Eastern regions show a much greater use of contraception for limiting purposes, with an average of 20 percent compared with the 5 percent average in the Western and middle regions. There is a slightly higher distribution of the L-S estimates which reach three-quarters in four of the countries with a high of 86 percent in Zimbabwe. The lowest value is in Ethiopia at 32 percent.

In summary, 34 of the 51 countries listed in Table 1 show at least half of Limiters had prior contraceptive spacing experience. The international variations no doubt reflect different family planning program histories including different menus of methods available and promoted. One implication is that the promotion of family planning for spacing can be viewed as a window onto its use for limiting but this generalization needs to be examined further both with time trend data as well as with analyses of individual covariates.

Table 1. Percentage of currently married women who are currently using a method for spacing or for limiting, and the percentage of Limiters who had formerly been Spacers or had only been Limiters.

Country	Year	Percentage of married women who are:		Percentage of current Limiters who were:	
		Spacers	Limiters	Past Spacers	Only Limiters
Asia and North Africa					
Armenia	2005	11	42	36	64
Azerbaijan	2006	8	44	29	71
Bangladesh	2007	15	41	65	35
Cambodia	2005	13	27	28	72
Egypt	2008	13	47	87	13
India	2005/06	5	51	24	76
Indonesia	2007	25	36	73	27
Jordan	2007	23	36	86	14
Morocco	2004	23	41	89	11
Nepal	2006	5	43	33	67
Philippines	2008	15	36	60	40
Turkey	2003	16	57	78	22
Ukraine	2007	24	43	62	38
Vietnam	2002	14	65	58	42
Mean		15	43	57	43
Latin America and Caribbean					
Bolivia	2008	17	43	55	45
Colombia	2005	17	63	84	16
Dominican Republic	2007	16	57	70	30
Guatemala	1999	8	30	59	41
Haiti	2006	14	18	43	57
Honduras	2006	23	42	69	31
Nicaragua	2001	20	48	73	27
Peru	2005	23	50	66	34
Mean		17	44	66	34

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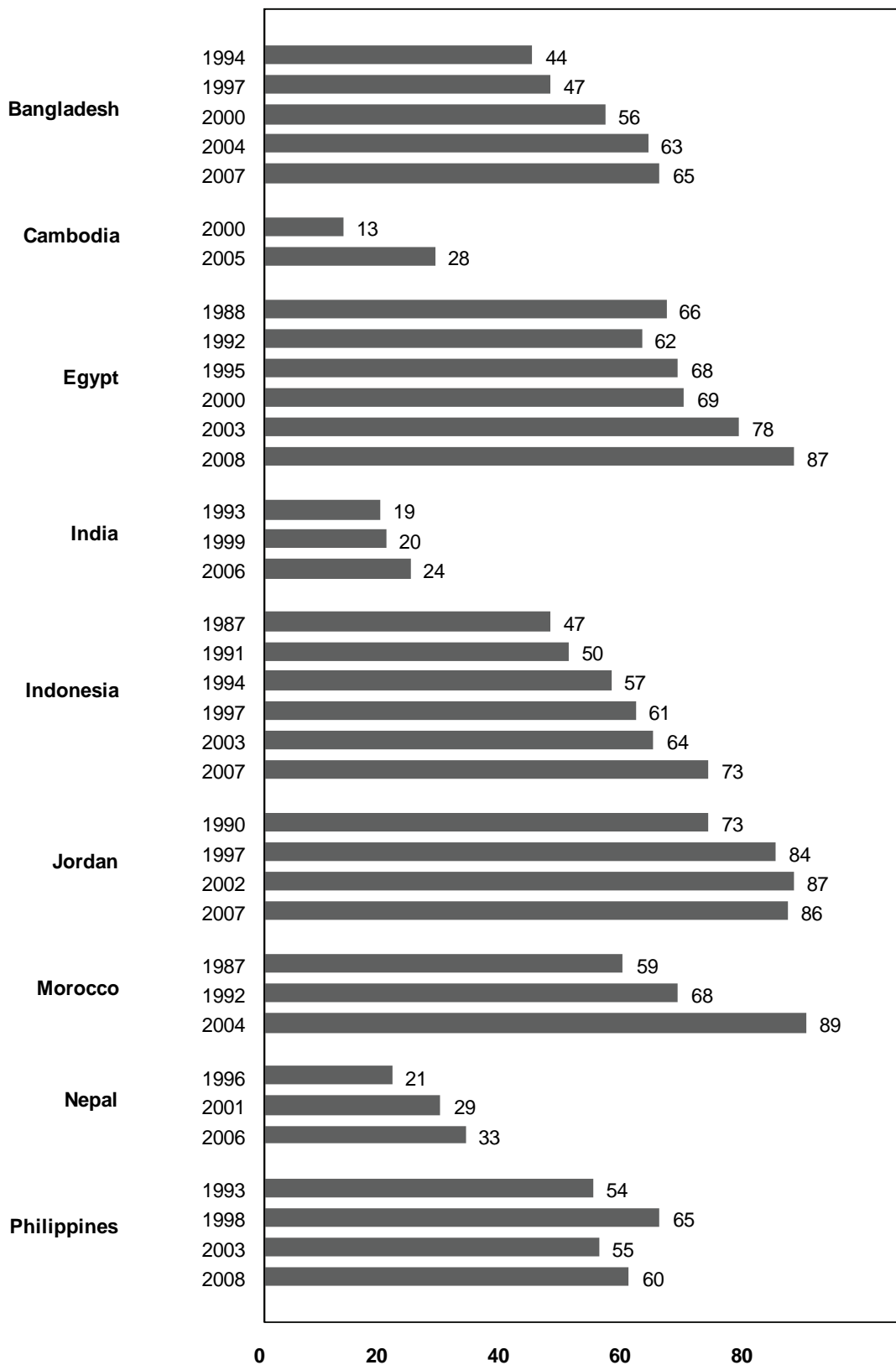
Table 1 – Continued

Country	Year	Percentage of married women who are:		Percentage of current Limiters who were:	
		Spacers	Limiters	Past Spacers	Only Limiters
Western and Middle Africa					
Benin	2006	10	7	66	34
Burkina Faso	2003	10	4	50	50
Cameroon	2004	18	8	65	35
Chad	2004	2	1	49	51
Congo Brazzaville	2005	35	9	64	36
Congo, Democratic Republic of the	2007	13	7	52	48
Cote d'Ivoire	1999	10	5	56	44
Gabon	2000	24	9	70	30
Ghana	2008	12	11	55	45
Guinea	2005	6	3	36	64
Liberia	2007	7	5	28	72
Mali	2006	5	3	56	44
Niger	2006	10	2	64	36
Nigeria	2008	9	6	52	48
Senegal	2005	7	4	48	52
Sierra Leone	2008	4	4	32	68
Mean		11	5	53	47
Southern and Eastern Africa					
Ethiopia	2005	7	8	32	68
Kenya	2009	17	28	70	30
Lesotho	2004	14	24	61	39
Madagascar	2009	19	21	48	52
Malawi	2004	16	17	51	49
Mozambique	2003	16	9	74	26
Namibia	2006	18	38	62	38
Rwanda	2005	7	10	46	54
Swaziland	2006	13	38	74	26
Tanzania	2004	16	11	65	35
Uganda	2006	11	13	47	53
Zambia	2007	25	16	77	23
Zimbabwe	2006	32	29	86	14
Mean		16	20	60	40

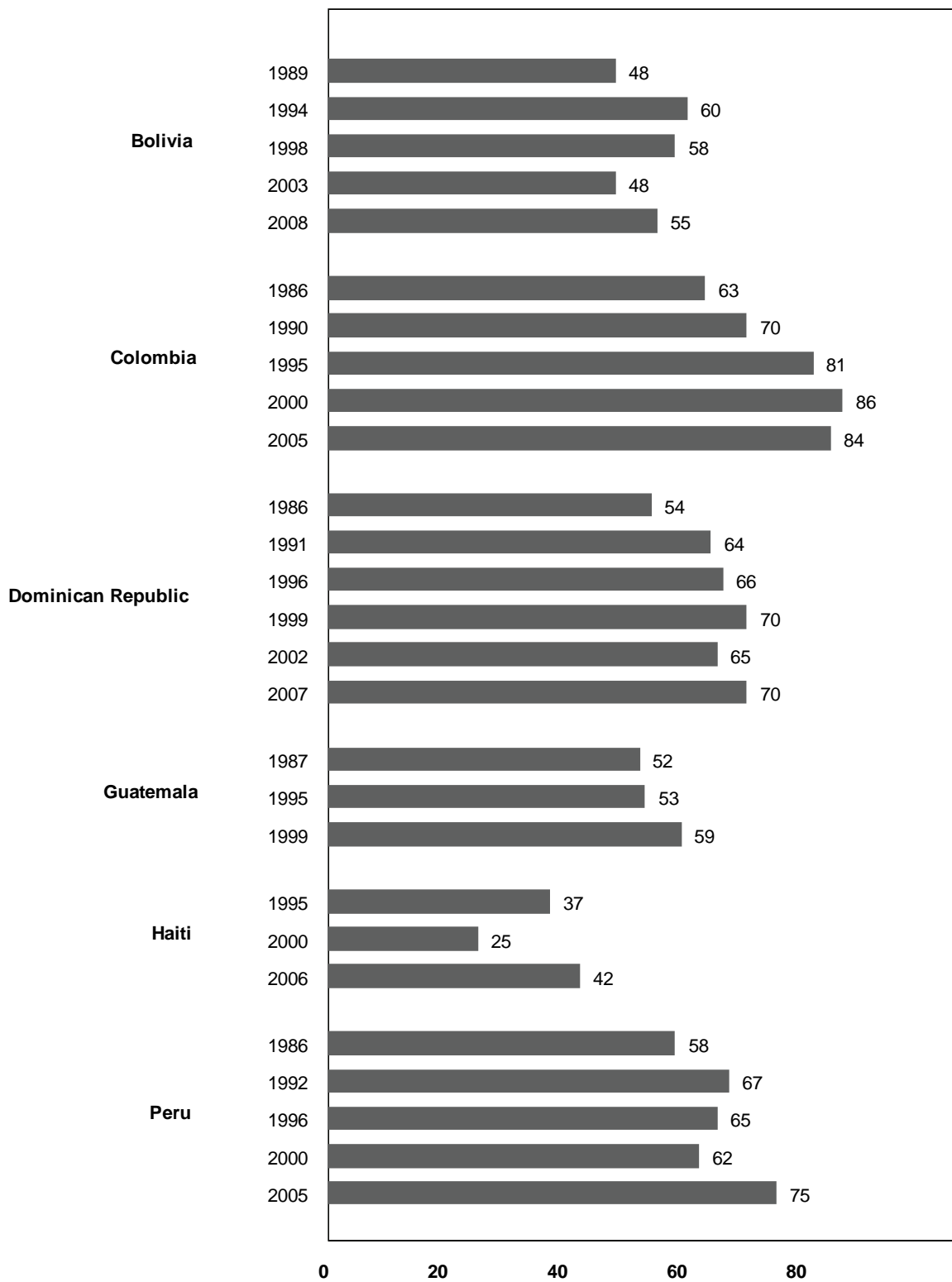
7. Trends in the Transition

We have also examined trends in the proportion of Limiters with prior spacing experience (Figure 2) for countries with multiple surveys. An increasing trend is evident in the more developed of these countries, especially in the Asia and North Africa region but the pattern is less clear in Latin America and the Caribbean. No such pattern is yet apparent in most of the sub-Saharan African countries. The patterns in sub-Saharan Africa will likely eventually become more like those in other countries when smaller families become more the norm.

**Figure 2. Percentage of Limiters who previously used contraception for spacing:
Asia and North Africa.**



**Figure 2 (continued). Percentage of Limiters who previously used contraception for spacing:
Latin America and the Caribbean.**



**Figure 2 (continued). Percentage of Limiters who previously used contraception for spacing:
Western and Middle Africa.**

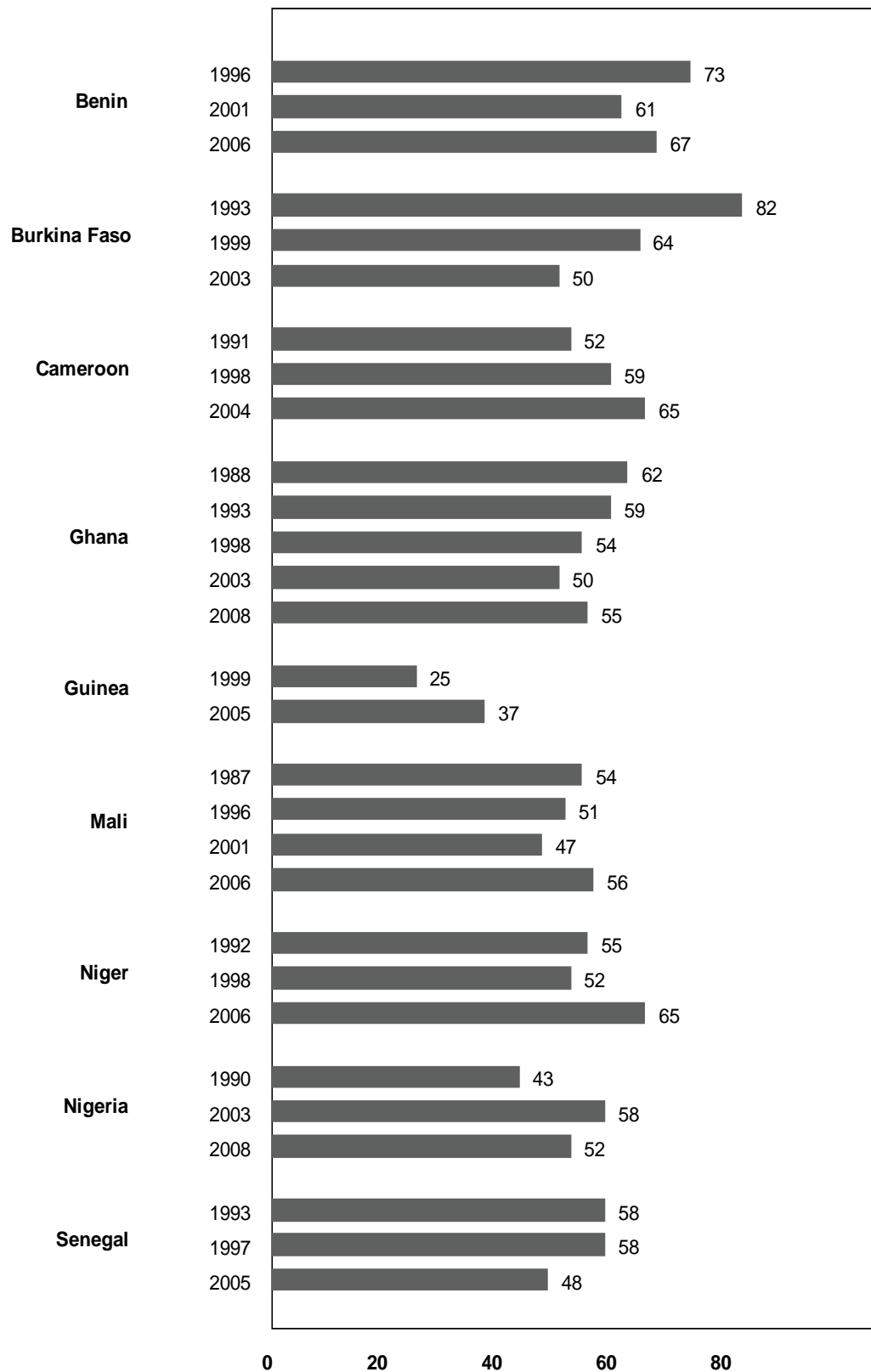
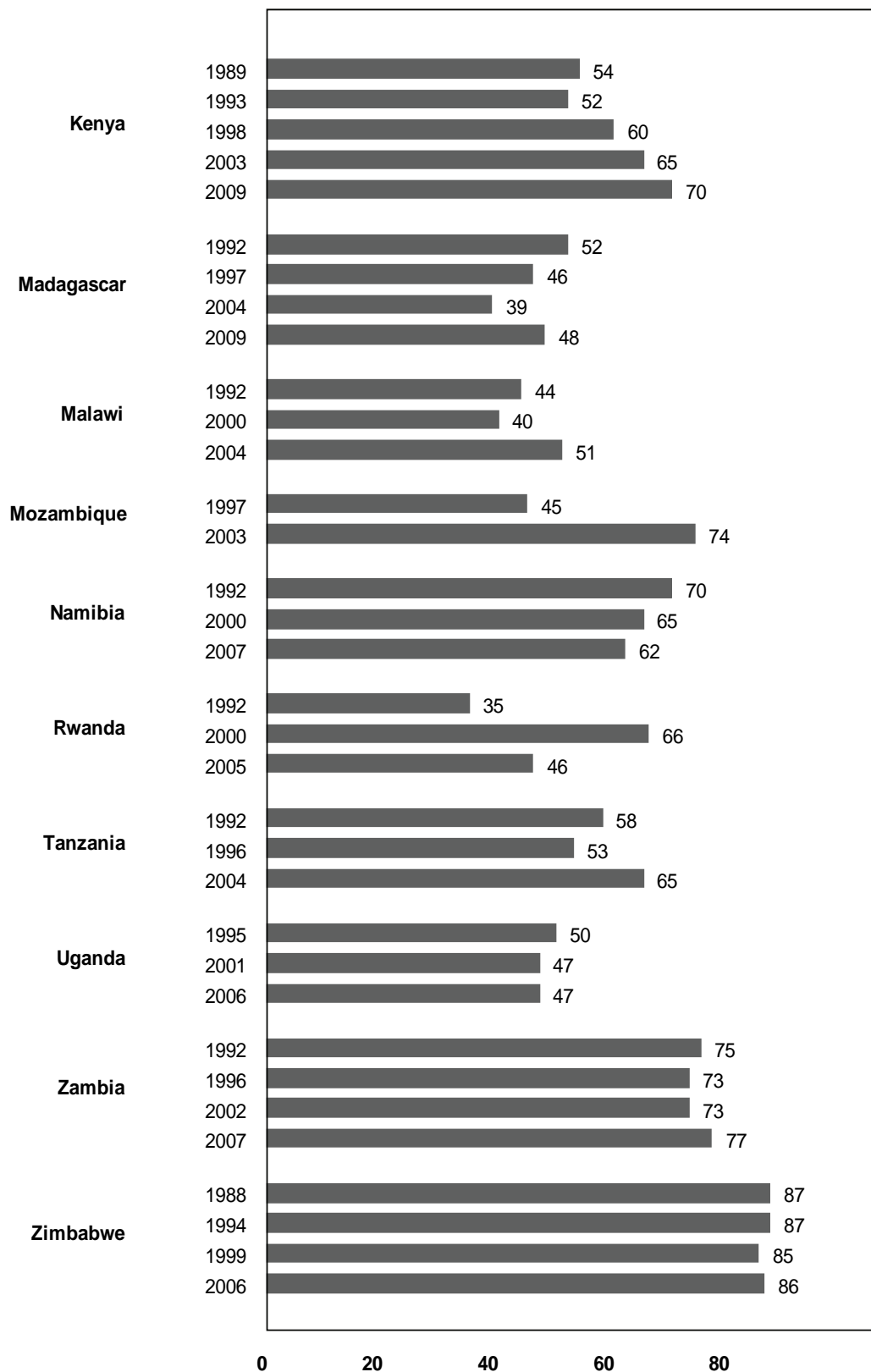


Figure 2 (continued). Percentage of Limiters who previously used contraception for spacing: Eastern and Southern Africa.



8. Differences between the Two Types of Limiters

Differences between Limiters with and without prior spacing experience are shown in Table 2. They are characterized by demographic, socio-economic, and mass media measures grouped by geographic regions. In row 2 of Table 2, we see that there is very little difference in their current ages, with an average age of 36 years. The characteristic that most sharply differentiates the two is the number of children at first use of contraception. In all four regions the mean parity at first use of a method is more than twice as high for Limiters with no spacing background than for those with spacing experience (row 3). This is of course to be expected since former Spacers would have used a method at an earlier stage in the reproductive process. Despite the longer experience with contraception that this implies, there is little difference either in the total number of children ever born (row 5) or in the number of children desired (row 4). On the other hand, Limiters with a spacing background had slightly more births in the five years preceding the interview (row 6). Those Limiters with no spacing experience report a higher proportion of these births as unwanted (row 7) and also report more deaths of children over the years (row 9).

Table 2. Differences in characteristics among Limiters with no former spacing experience and those with spacing experience.

Row	All Regions		Asia/North Africa		Latin America/ Caribbean		Western/Middle Africa		Eastern/ Southern Africa	
	Only Limiters	Former Spacers	Only Limiters	Former Spacers	Only Limiters	Former Spacers	Only Limiters	Former Spacers	Only Limiters	Former Spacers
1	69,927	82,177	50,650	44,035	12,023	27,401	2,712	3,222	4,542	7,510
2	36.2	36.3	36.3	36.4	35.0	35.6	37.6	37.5	34.9	35.6
3	4.3	1.7	3.1	1.4	4.0	1.4	5.4	1.9	4.4	1.9
4	4.0	3.9	2.7	2.9	3.2	3.0	5.4	5.4	4.2	4.0
5	4.7	4.7	3.3	3.7	4.3	3.9	5.9	5.9	5.0	4.9
6	49	58	30	44	47	48	56	70	62	68
7	35	22	30	22	52	33	28	16	37	23
8	79	73	71	74	83	83	79	55	87	83
9	64	74	78	85	69	84	52	59	58	72
10	18.4	18.8	18.5	19.1	18.6	18.8	17.7	18.1	18.5	19.1
11	45	54	43	53	47	60	53	61	36	44
12	5.2	6.6	6.0	8.0	4.7	6.8	4.0	4.9	5.4	7.0
13	3.3	3.5	3.0	3.2	2.7	3.0	3.6	3.8	3.5	3.7
14	62	60	51	42	52	54	75	77	64	65
15	1.2	1.1	0.8	0.8	0.7	0.6	1.7	1.7	1.2	1.1
16	51	50	35	29	51	52	59	56	59	62
17	33	39	49	53	31	42	30	35	19	27
18	15	20	17	20	16	26	12	14	14	23
19	32	43	40	49	44	59	20	25	34	47
20	73	76	53	58	89	91	79	78	80	83
21	54	63	83	90	64	76	46	53	30	43

¹ Among women with a birth in past five years

The difference in the percentage of unwanted last births shown in Figure 3 is worth further attention. One might plausibly expect that the experience of an unwanted birth might mark the entrance into the category of a Limiter. Indeed, there is a higher proportion of women with unwanted births among Limiters with no previous spacing record. In all countries except Liberia, the proportion of Limiters with spacing experience report a lower proportion of their last birth in the past five years as unwanted (in Niger, there is no difference). That adds up to 47 countries with higher unwanted fertility among Limiters with no spacing background.

As Spacers move into the category of Limiters, one might expect that a higher proportion would use modern methods. However, this is not clear at all (row 8 in Table 2) and in Western and Middle Africa there is a large difference in the opposite direction. A detailed description of method use is presented in Table 3 for each individual country. A comparison of the main method used in the last two columns of Table 3 suggests that Spacers simply continue to use the same method as they enter the stage of wanting no more children.

Limiters with past spacing experience are more likely to have married at slightly older ages (row 10 in Table 2), to live in cities (row 11), to have more education (row 12) and to have slightly greater wealth (row 13). Neither the wife's labor force status nor the index of gender bias in decision making (rows 14 and 15) shows any association with the Spacing – Limiting dichotomy. The gender role measure here, labeled as “Husband Final Say” is a summary index of four questions on who makes the final decisions on health care, large household purchases, items purchased for daily needs, and visits to family and relatives. The index is constructed so that a positive sign means that the husband alone makes such decisions. It is intended as a measure of gender equality and considered relevant to whether birth spacing was used before the number of children desired was reached. The Wealth index is coded in quintiles for each country.

Exposure to messages about family planning on the radio shows no association here (row 16) though television and print family planning messages suggest greater influence among Limiters with spacing experience. Exposure to the media in general shows a fairly consistent higher proportion of Limiters with spacing experience.

Figure 3. Percentage of last births in the past five years that were unwanted among Limiters with (LS) and without (LO) earlier spacing experience.

Asia and North Africa

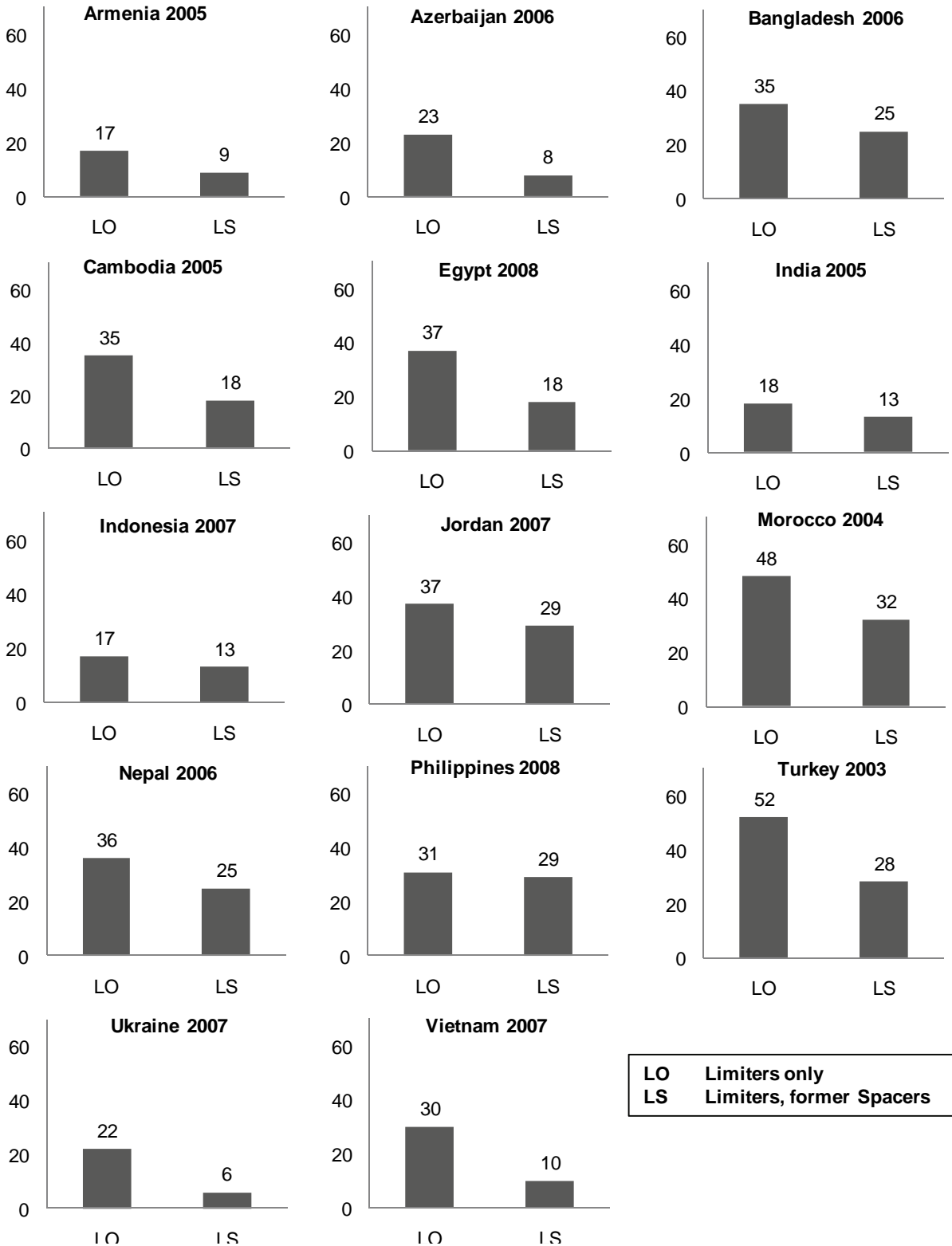
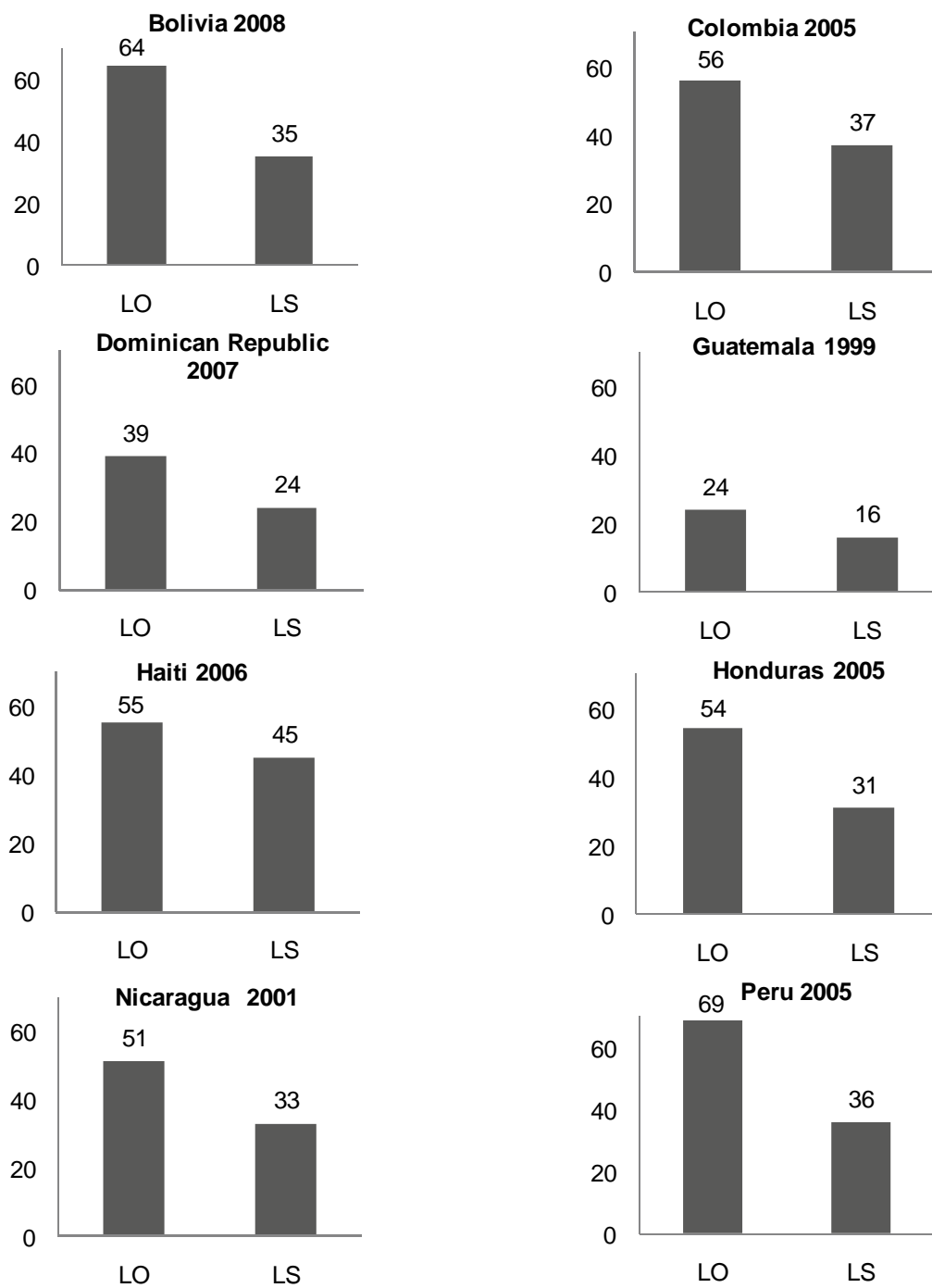


Figure 3 (continued). Percentage of last births in the past five years that were unwanted among Limiters with (LS) and without (LO) earlier spacing experience.

Latin America and the Caribbean



LO	Limiters only
LS	Limiters, former Spacers

Figure 3 (continued). Percentage of last births in the past five years that were unwanted among Limiters with (LS) and without (LO) earlier spacing experience.

Western and Middle Africa

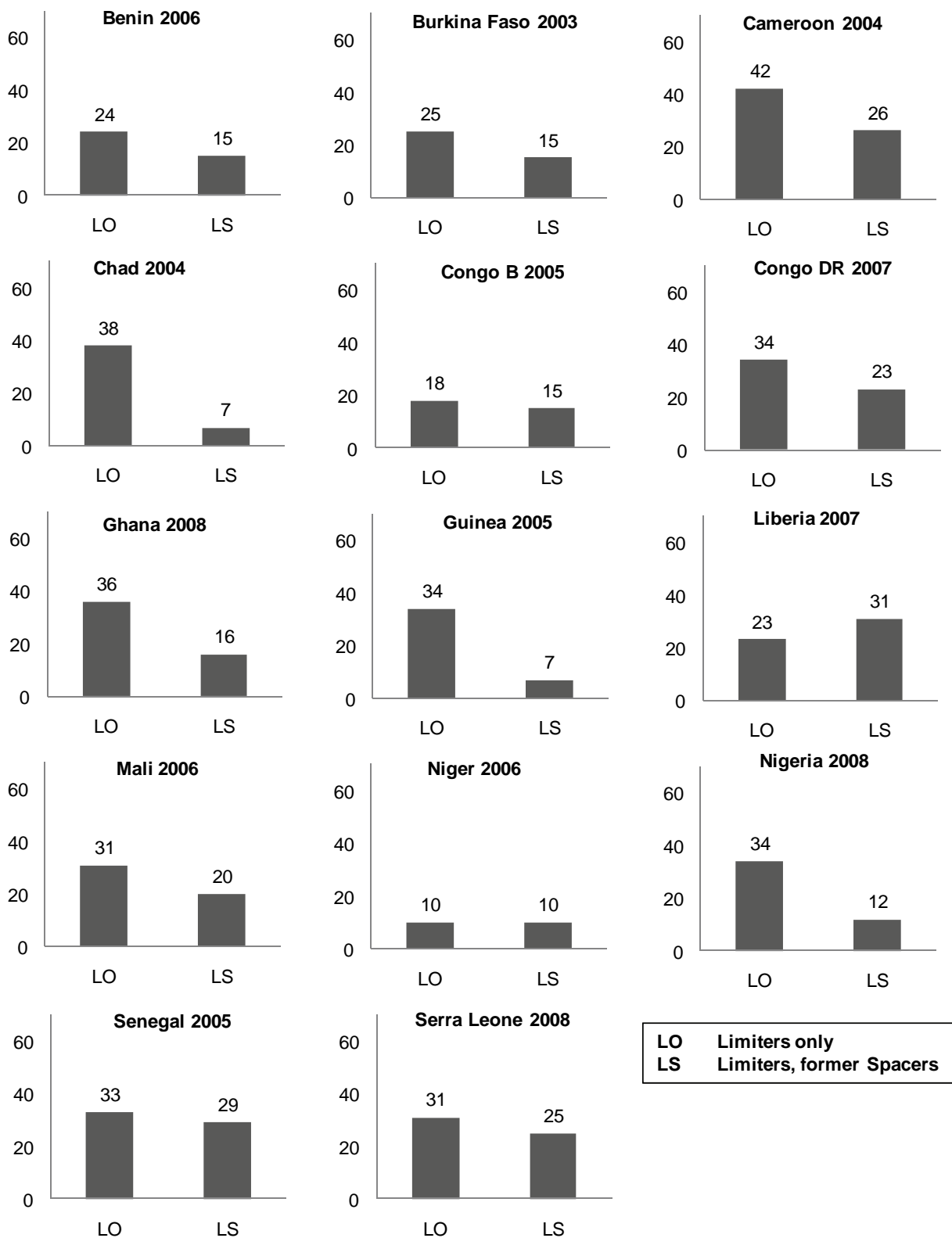
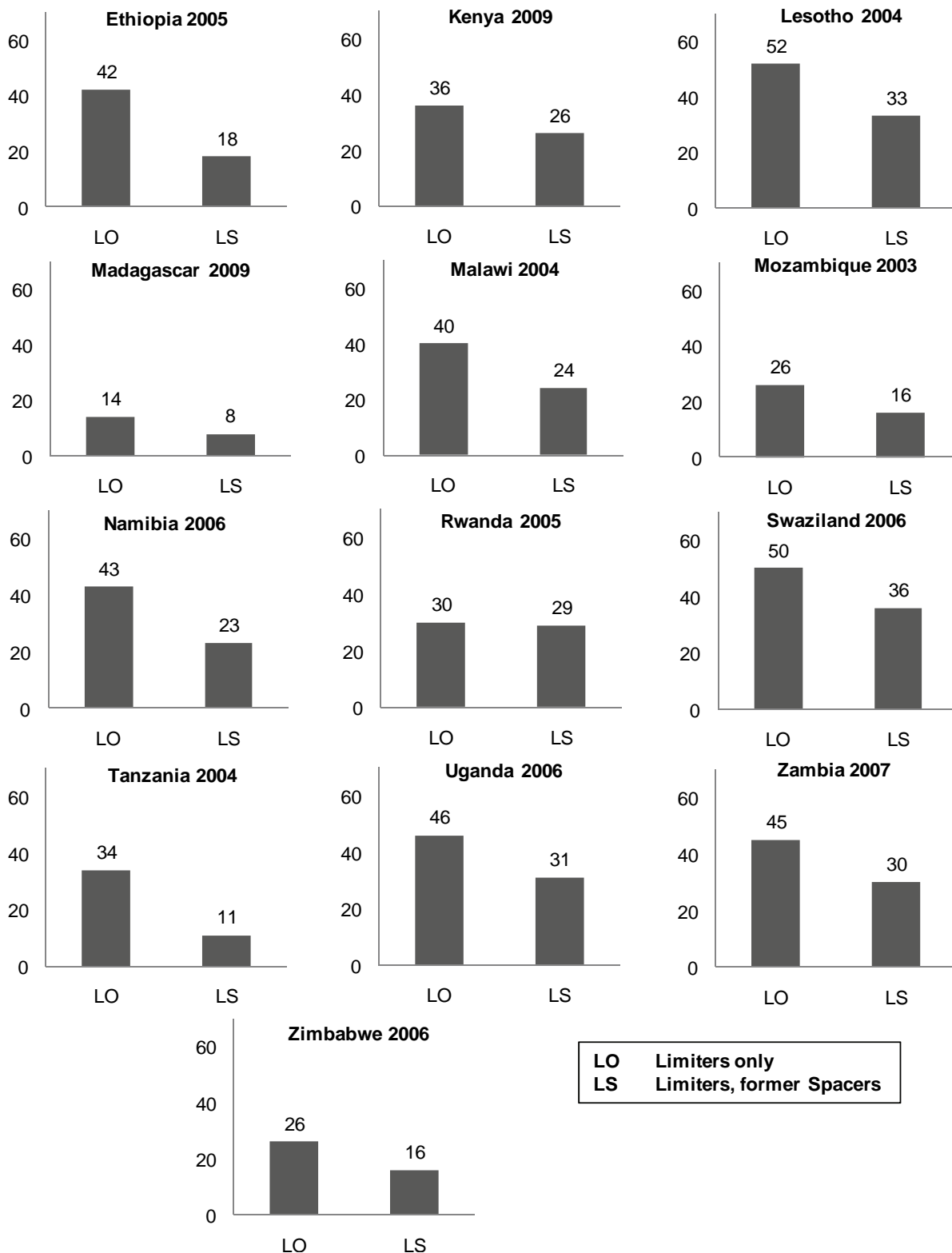


Figure 3 (continued). Percentage of last births in the past five years that were unwanted among Limiters with (LS) and without (LO) earlier spacing experience.

Eastern and Southern Africa



9. Method Use

The prior observation that there is little evidence of method switching associated with the shift from spacing to limiting is confirmed in Table 3. This table shows two sections for each country: the proportions currently using modern methods for the two types of Limiters in the first two columns (the same statistic in row 8 of Table 2 but for countries rather than summarized by regions) and the modal or main specific method currently used. As noted above, Limiters with spacing backgrounds are less likely to be using a modern method, a difference that is particularly striking in the countries of Western and Middle Africa. In the third and fourth columns, for the most part there is little difference in the main method used by the two categories of Limiters, those with and without prior spacing experience. This may indicate that the same method last used for spacing is continued when the reason for use switches to limiting.

Table 3. Percentage of current Limiters using a modern method and the main method used by Limiters only compared with Limiters who had formerly been Spacers.

Country	Year	Current Limiters		Main Method Used* by Limiters	
		Only Limiters	Former Spacers	Only Limiters	Former Spacers
Asia and North Africa					
Armenia	2005	37	29	W	W
Azerbaijan	2006	29	22	W	W
Bangladesh	2007	85	84	Pill	Pill
Cambodia	2005	74	62	Pill	W
Egypt	2008	97	96	IUD	IUD
India	2005	92	78	Ster	Ster
Indonesia	2007	95	93	Inj	Inj
Jordan	2007	78	76	IUD	IUD
Morocco	2004	87	86	Pill	Pill
Nepal	2006	95	89	Ster	Ster
Philippines	2003	77	65	Ster	Ster
Turkey	2003	57	63	W	W
Ukraine	2007	72	68	Cond	IUD
Vietnam	2002	77	69	IUD	IUD
Latin America and Caribbean					
Bolivia	2008	57	57	PA	PA
Colombia	2005	87	89	Ster	Ster
Dominican Republic	2007	98	97	Ster	Ster
Guatemala	1999	91	81	Ster	Ster
Haiti	2006	82	72	Inj	Inj
Honduras	2006	90	88	Ster	Ster
Nicaragua	2001	97	97	Ster	Ster
Peru	2005	67	67	PA	PA

(Continued...)

Table 3 – Continued

Country	Year	Current Limiters		Main Method Used* by Limiters	
		Only Limiters	Former Spacers	Only Limiters	Former Spacers
Western and Middle Africa					
Benin	2006	67	30	PA	PA
Burkina Faso	2003	86	52	Inj	PA
Cameroon	2004	63	43	Inj	PA
Chad	2004	98	64	PA	PA
Congo, Brazzaville	2005	35	28	PA	PA
Congo, Democratic Republic of the	2007	50	28	PA	PA
Cote d'Ivoire	1999	53	47	PA	PA
Gabon	2000	62	55	PA	PA
Ghana	2008	82	68	Inj	PA
Guinea	2005	75	65	Pill	LAM
Liberia	2007	97	94	Inj	Pill
Mali	2006	89	90	Inj	Pill
Niger	2006	93	55	Inj	LAM
Nigeria	2008	77	62	Inj	PA
Senegal	2005	92	83	Inj	Pill
Sierra Leone	2008	72	90	Inj	Pill
Southern and Eastern Africa					
Ethiopia	2005	98	90	Inj	Inj
Kenya	2009	90	86	Inj	Inj
Lesotho	2004	94	94	Inj	Inj
Madagascar	2009	85	63	Inj	Inj
Malawi	2004	92	84	Inj	Inj
Mozambique	2003	86	81	Inj	LAM
Namibia	2006	98	97	Inj	Inj
Rwanda	2005	66	53	Inj	PA
Swaziland	2006	96	93	Inj	Inj
Tanzania	2004	90	74	Inj	Inj
Uganda	2006	81	74	Inj	Inj
Zambia	2007	88	78	Pill	Pill
Zimbabwe	2006	98	97	Pill	Pill

* W = Withdrawal; Ster = Sterilization; Inj = Injectable; IUD = Intrauterine device; Cond = Condom;
PA = Periodic Abstinence; LAM = Lactational Amenorrhea

10. Multivariate Analyses

Thus far we have examined simple differences between the Limiter-Spacer combinations with education, residence, wealth and exposure to mass media as well as with age, fertility and methods of contraception. The next section examines these and other covariates simultaneously in a set of logistic regressions in which the dependent variable is defined as Limiters who had no prior spacing experience compared with Limiters who earlier had been Spacers. It is important to remember that these analyses focus exclusively on Limiters, a category that varies in size significantly from country to country. On average, the percentage of all married women who are current Limiters ranges from a low of 5 percent in western and Middle Africa, 20 percent in Southern and Eastern Africa to 43-44 percent in Asia, North Africa, Latin America and the Caribbean (Table 1). Countries are weighted equally in these analyses in order to avoid giving greater importance to countries with large samples.

One of the first observations in the multivariate analysis (Table 4) is that the number of births wanted increases significantly for Limiters with spacing experience; conversely the number of unwanted births is lower. This pattern is present in all regions. This is the complement of the reverse observation that women with unwanted fertility had less spacing experience. With greater contraceptive use for spacing, the likelihood of later contraceptive failure would diminish. Child mortality is negatively associated across all regions – the earlier contraceptive use for spacing is related to reduced child mortality. This association is particularly strong and deserves additional attention.

The use of modern vs. traditional methods shows an interesting pattern. For all countries combined, the odds indicate that a traditional method of contraception is used by Limiters with a spacing background but in the Asia/North Africa region the odds favor modern method use by this category of Limiters. In the other regions, especially in the Western/Middle Africa region, the use of traditional methods dominates.

Living in rural areas is not associated with having spaced births with contraception except in Asia/North Africa and Southern and Eastern Africa. In the Latin America/Caribbean region, residence in cities is also associated with having been a Spacer but is not significant in Table 4 because several countries are excluded due to missing data on other variables.

Years of schooling is positively associated with the Limiter – Spacer combination in all regions. Wealth is similarly related.

Exposure to radio messages on family planning is, for unknown reasons, negatively correlated with the likelihood of Limiters having been Spacers especially in the Asia/North Africa region. Print messages show some positive association. The main finding here is a consistent positive correlation of earlier spacing experience with the frequency with which television in general is viewed.

In summary, the analysis shows that Limiters who had been Spacers:

- Are less likely to have had unwanted births;
- Are less likely to have experienced a child death;
- Are less likely to have adopted a modern method of contraception (except in Asia/North Africa);
- Are more likely to have more years of schooling;
- Are more likely to have been exposed to mass media generally.

On the whole, the search for covariates of the Limiter-Spacer combination has not been especially fruitful. The most interesting findings are the associations with unwanted births, with child survival, with more education and with a greater frequency of watching television. It should be kept in mind that the populations examined in this part of the analysis consist only of Limiters who are in the minority especially in sub-Saharan Africa.

Table 4. Odds ratios* of Limiters having been Spacers, by region.

Covariate	All Countries	Asia/ North Africa	Latin America/ Caribbean	Western/ Middle Africa	Eastern/ Southern Africa
Number of births wanted	1.27	1.47	1.30	1.20	1.26
Number of births unwanted	0.97	0.90	0.91	0.94	0.96
Number of child deaths	0.70	0.68	0.58	0.85	0.64
Age	0.98	0.97		0.98	0.99
Rural residence		0.90			0.87
Years of schooling	1.05	1.04	1.08	1.02	1.09
Wife working	0.92	0.89			
Wealth	1.03	1.03		1.08	0.94
Using modern method	0.75	1.35	0.78	0.34	0.69
FP messages on radio	0.84	0.65	0.89		
FP messages on TV			1.14		0.85
FP messages in print	1.21		1.27		1.44
Read newspapers frequently			1.06		
Listen to radio frequently	1.05	1.17			
Watch TV frequently	1.11	1.20	1.11	1.15	1.15
Husband has final say	0.97				
Number of women	115,899	86,626	13,321	5,174	10,778
Chi squared	1,522	2,973	810	324	670
R squared	0.04	0.07	0.07	0.06	0.06

* Only odds ratios significant at least at the 0.05 level are shown

11. The Effect of Spacing Experience on Desired Family Size

In this final section, we return to the overall picture for all currently married women and examine the association of desired number of children with contraceptive use and spacing and limiting status² (Figure 4). The section concludes with a review of trends in spacing and limiting behavior in countries with multiple surveys.

In Figure 4, we see a general pattern that appears at each age and in each world region. First, the number of children desired is, not surprisingly, highest for women who have never used any method of contraception. The second category consists of women who have previously used a method but who are not currently using contraception which would include those who interrupted use to have a child and other reasons. Their desired number of children is essentially the same as the third category of current Spacers

² The measure of the desired number of children is based on the standard question on ideal number since the sample here is not only Limiters but all married women. Women who gave non-numeric responses to the question were excluded from the analysis.

which is not surprising considering that many had recently been Spacers. The desired number of children for both of these groups is lower than that for those who never used any method except in the Asian and North African countries. Of course, the proportion of women that has never used any method is considerably lower in the more developed countries. Since the number of children desired by women in the second and third categories in other regions is consistently lower, age by age, than for Never Users it raises the question of whether Spacers are selected for women who want fewer children to begin with or whether the contraceptive experience serves to lower earlier large family-size preferences.

The remaining two categories in Figure 4 are both Limiters. These women, at all ages, want the fewest children. Again the question is whether these women are self-selected for lower reproductive preferences or whether their earlier contraceptive experience as Spacers played a role. The fourth and fifth categories are distinguished by whether Limiters had previously been Spacers. In the Asian and North African countries there is no difference between these two categories. However, in the other regions at older ages where Limiters would be concentrated, women who once had been Spacers want slightly fewer children than women whose only contraceptive experience had been as Limiters, lending some support to the hypothesis that the spacing experience might lower preferences.

In Figure 5 the trends over time in the proportions of Spacers and Limiters are depicted for 28 countries that have conducted three or more surveys. For some of these countries, estimates from surveys before the DHS have been included to provide a picture of some 30 years of change.

In the Asian, North African, Latin American and Caribbean nations included in this review, the proportion of Limiters exceeds the proportion of Spacers in every survey (a total of 65 observations in 12 countries) in these two regions. In contrast, almost all observations in the Middle and Western African countries show the reverse pattern: Spacers outnumber Limiters. Countries in Eastern and Southern Africa show a much more mixed picture with Limiters more numerous than Spacers in some countries and the opposite in other countries. In general, the trend is upward for both spacing and limiting behavior. In Bangladesh, for example, the 3 percent spacing in 1980 grew to 15 percent 25 years later while the percent limiting increased from 10 to 41 percent. Similar pictures appear in Egypt and in most of the other countries in the region as well as in most of Latin American and the Caribbean. There are some variations in the magnitudes, e.g., in India the increase is all among Limiters with very little spacing. A similar pattern appears in Nepal as well. In contrast, spacing is more prominent in Indonesia although still overshadowed by limiting. In the Dominican Republic there is a very pronounced increase in Limiters from 23 percent in 1975 to 57 percent by 2007. However, Haiti is a very different story with only 18 percent being Limiters as of the last survey in 2006. In Peru, after a rapid increase in the proportion of Limiters from 1977 to 2000, the upward trend has stalled though a substantial minority uses contraception for spacing, a trend that seems to be increasing.

The situation in Middle and Western Africa is familiar with very low proportions using contraception for either purpose, especially for limiting. There are some signs of increases such as in Cameroon and in Ghana but little elsewhere. In Nigeria, the most populous country in the region, only 6 percent of women were using for limiting by 2008.

The picture in Eastern and Southern Africa is different. In Kenya, the proportions limiting births grew from 4 percent in 1977 to 28 percent in 2009 with an accompanying increase in spacing from 2 to 17 percent. Similar patterns are evident in Namibia, Zambia and Zimbabwe. On the other hand, there is only a slow increase in Tanzania and Uganda. It is going to take a while longer to see a more rapid rate of increase but this seems more likely in this region of Africa than in the middle and Western part of the continent.

Figure 4. Mean number of children desired by married women by current contraceptive use and spacing and limiting status.

Asia and North Africa

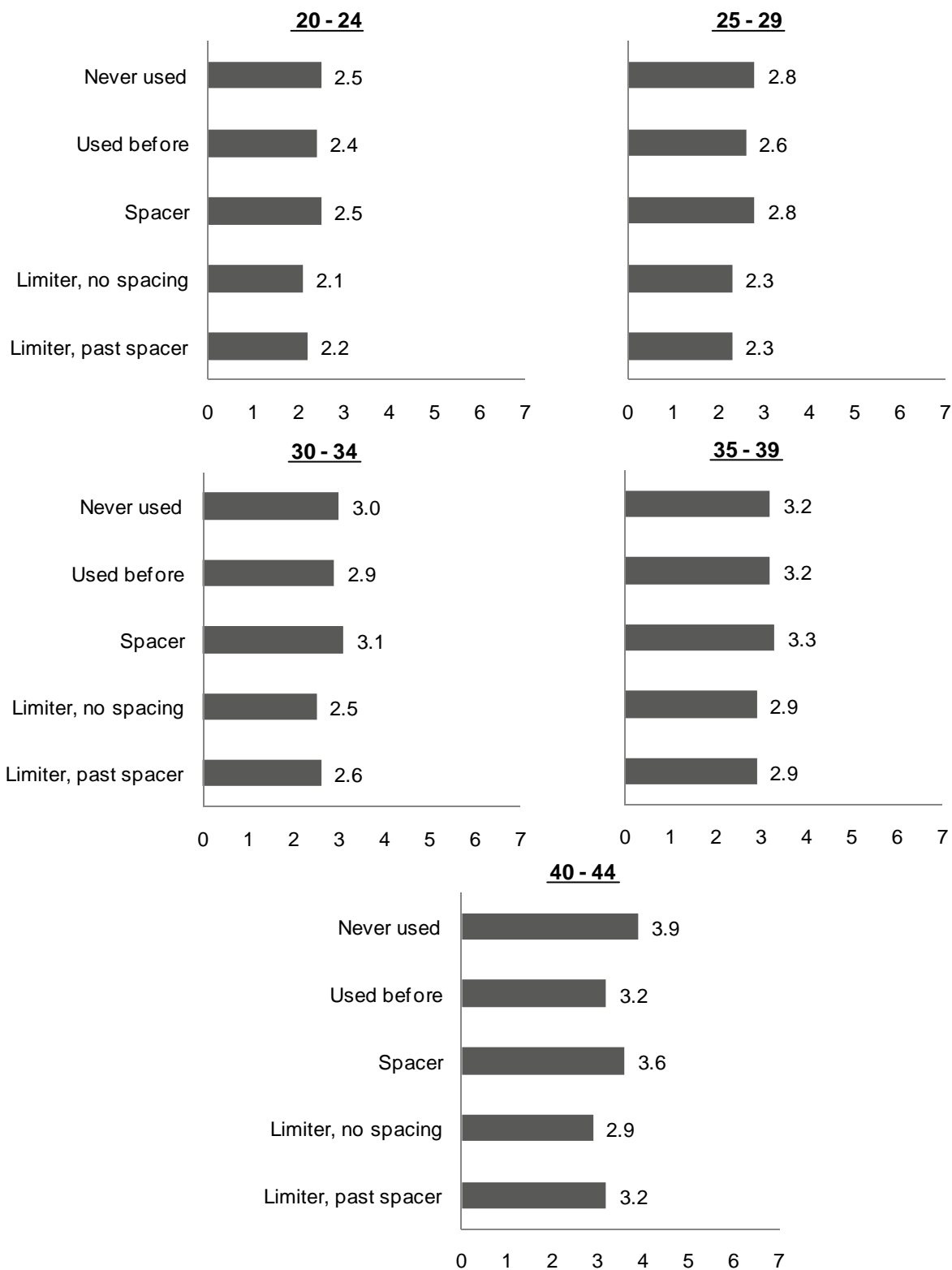


Figure 4 (continued). Mean number of children desired by married women by current contraceptive use and spacing and limiting status.

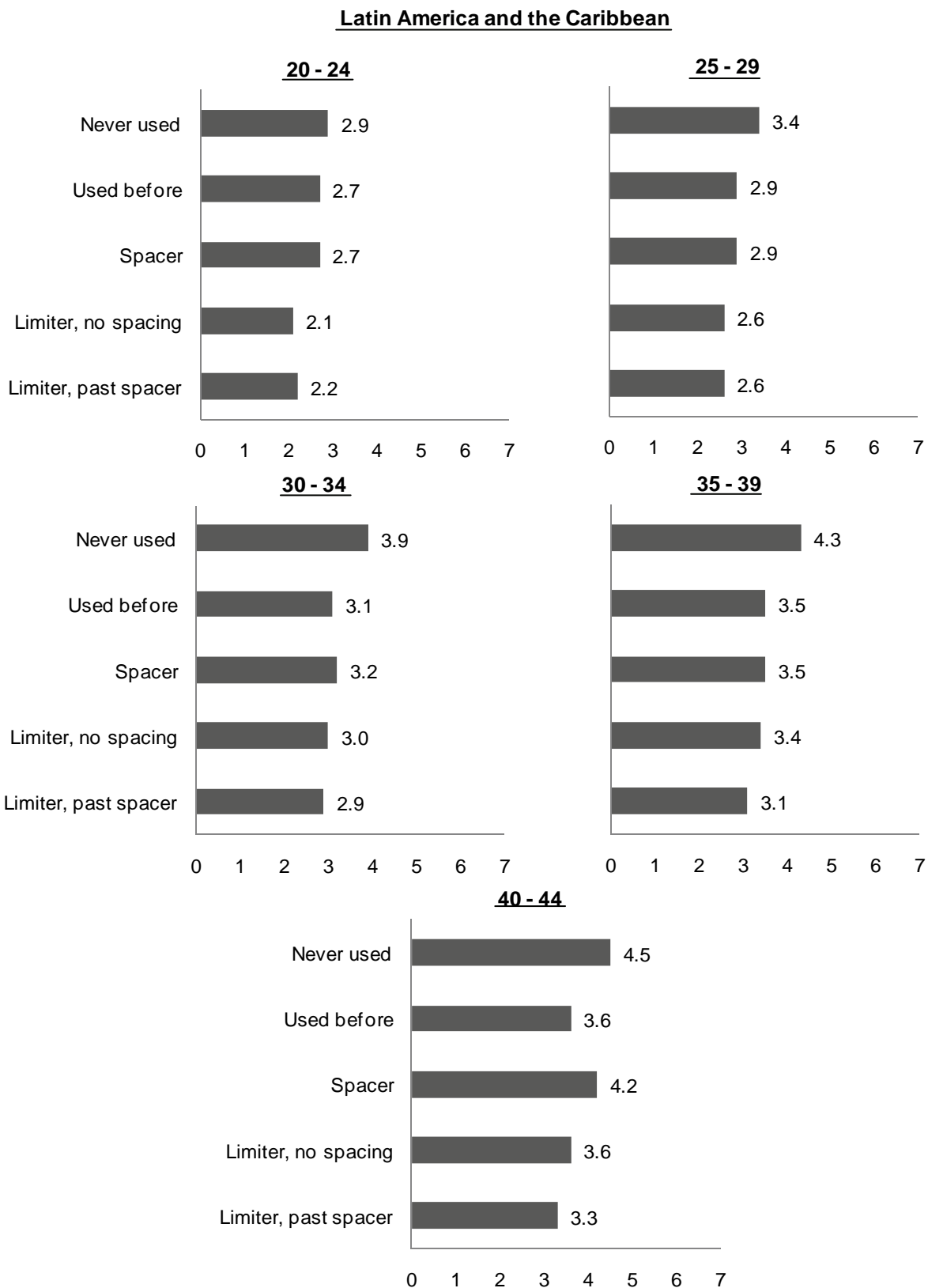


Figure 4 (continued). Mean number of children desired by married women by current contraceptive use and spacing and limiting status.

Western and Middle Africa

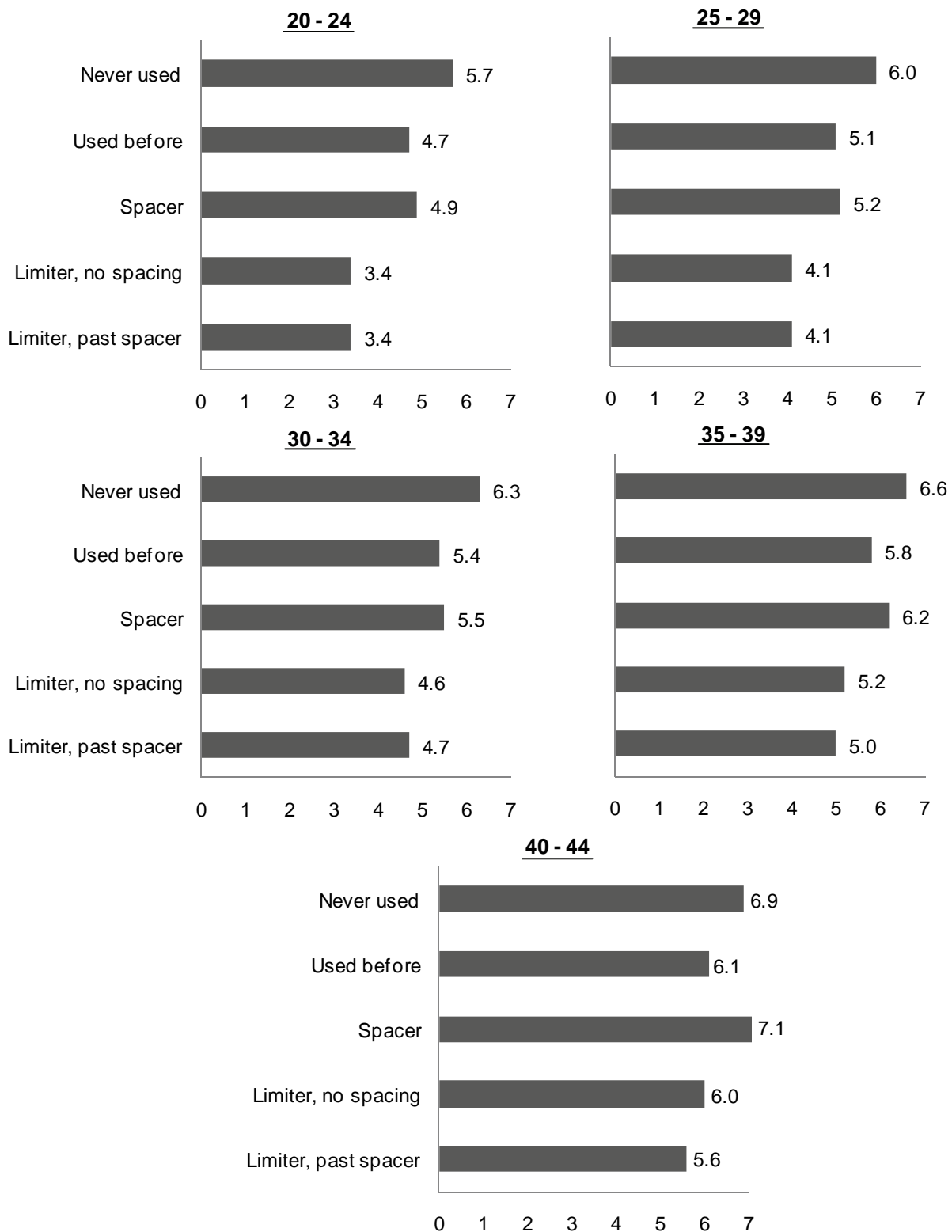


Figure 4 (continued). Mean number of children desired by married women by current contraceptive use and spacing and limiting status.

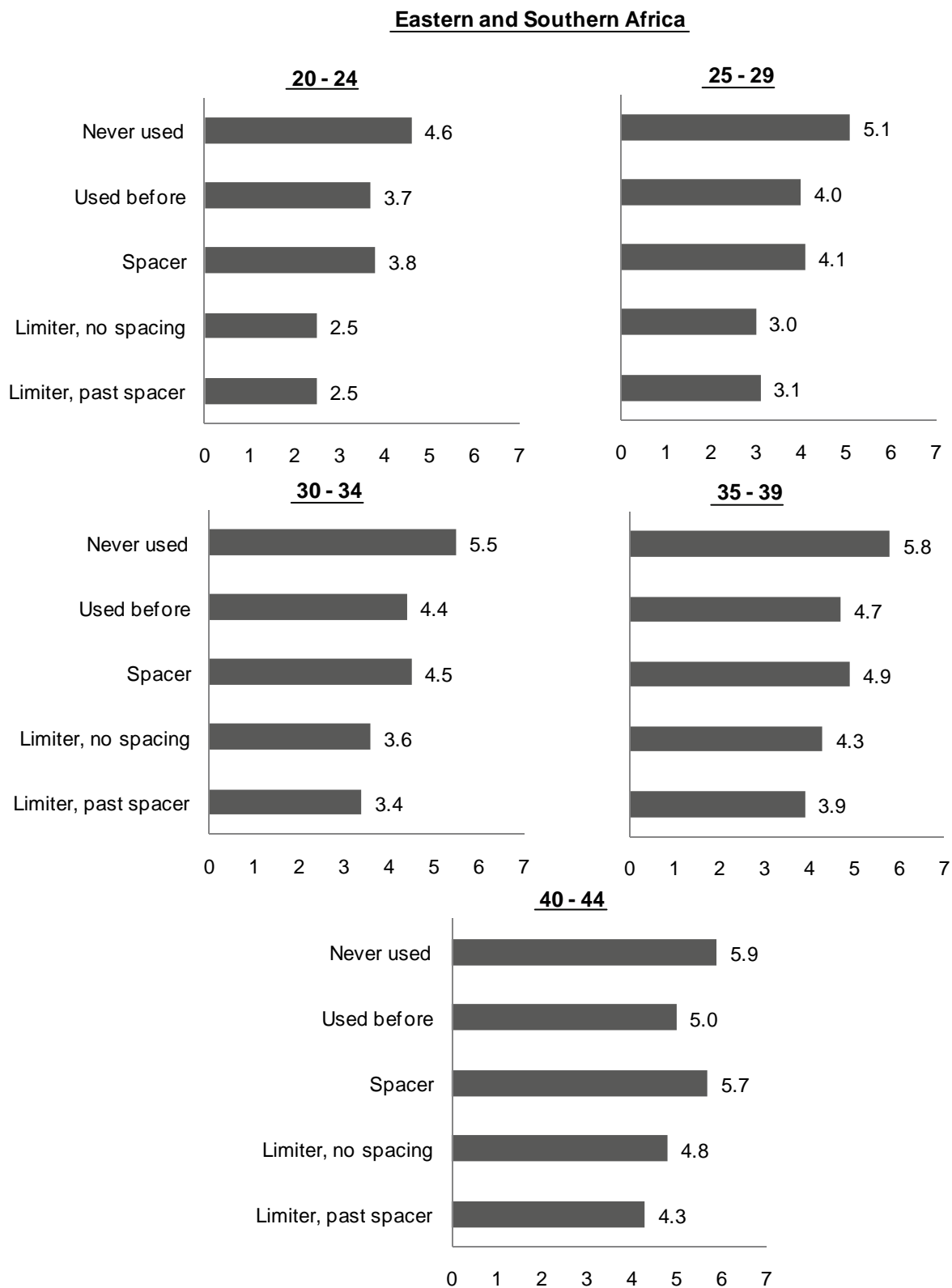


Figure 5. Trends in the current use of contraception for spacing and for limiting births, for currently married women age 15–49.

Asia and North Africa

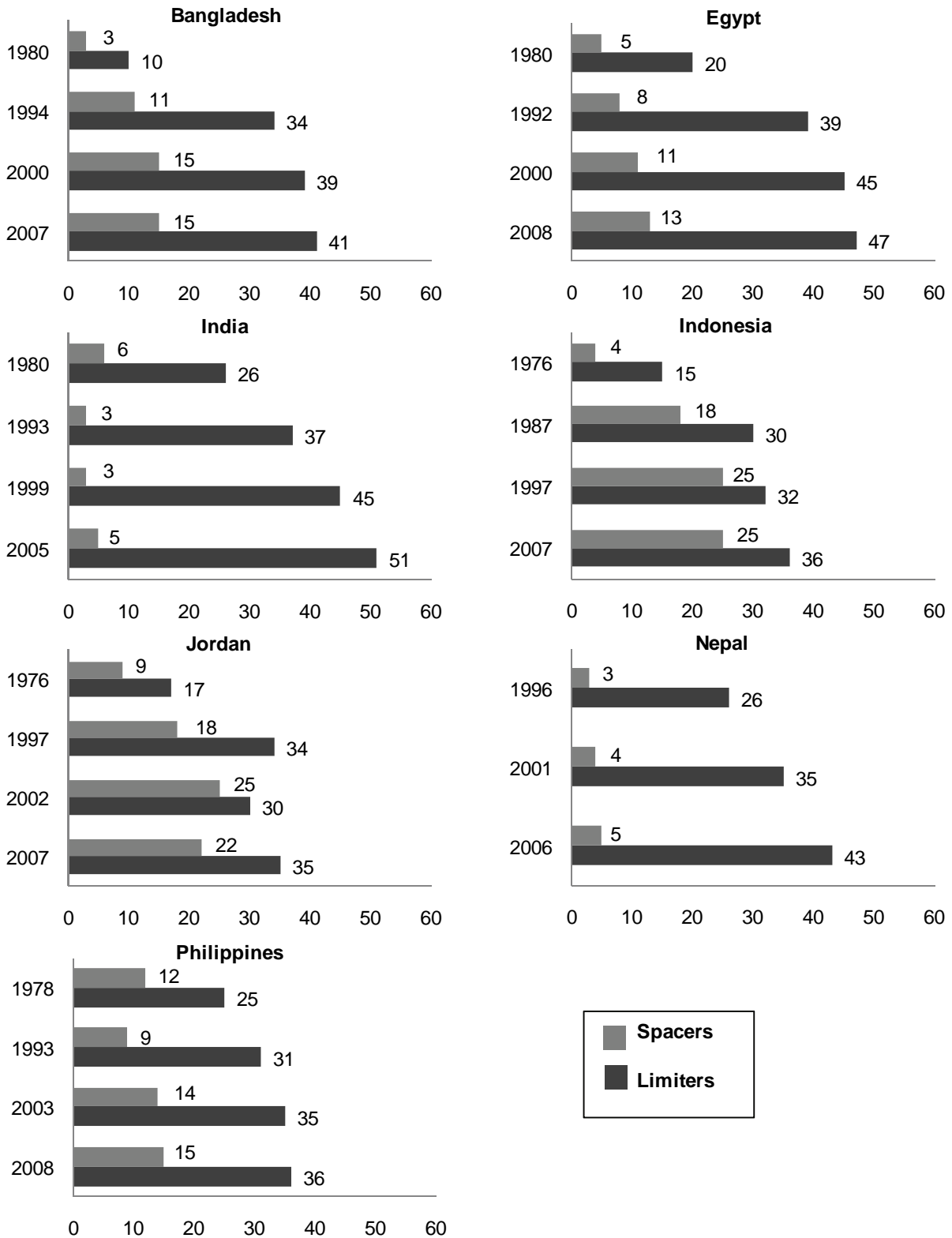


Figure 5 (continued). Trends in the current use of contraception for spacing and for limiting births, for currently married women age 15–49.

Latin America and the Caribbean

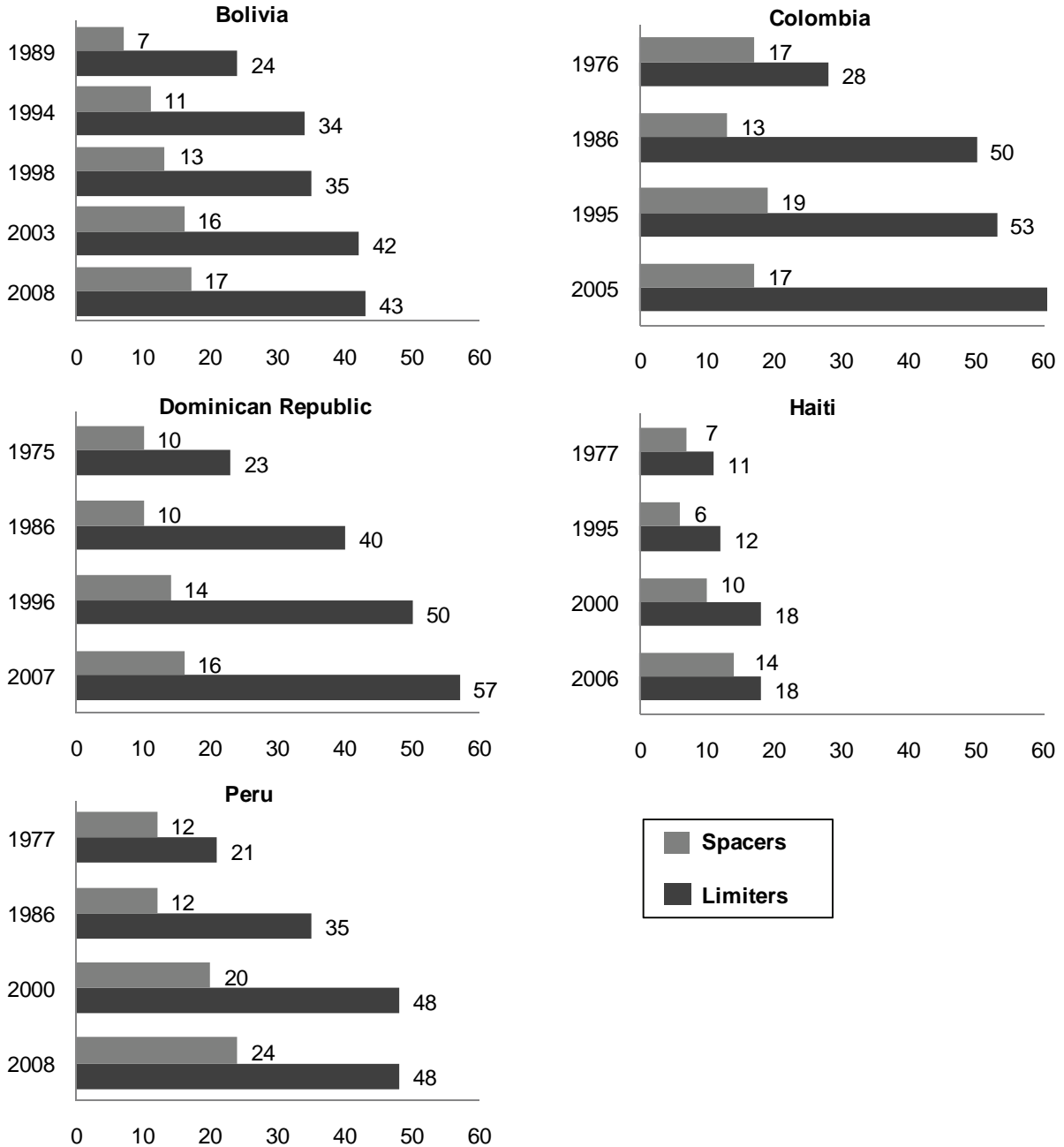


Figure 5 (continued). Trends in the current use of contraception for spacing and for limiting births, for currently married women age 15–49.

Western and Middle Africa

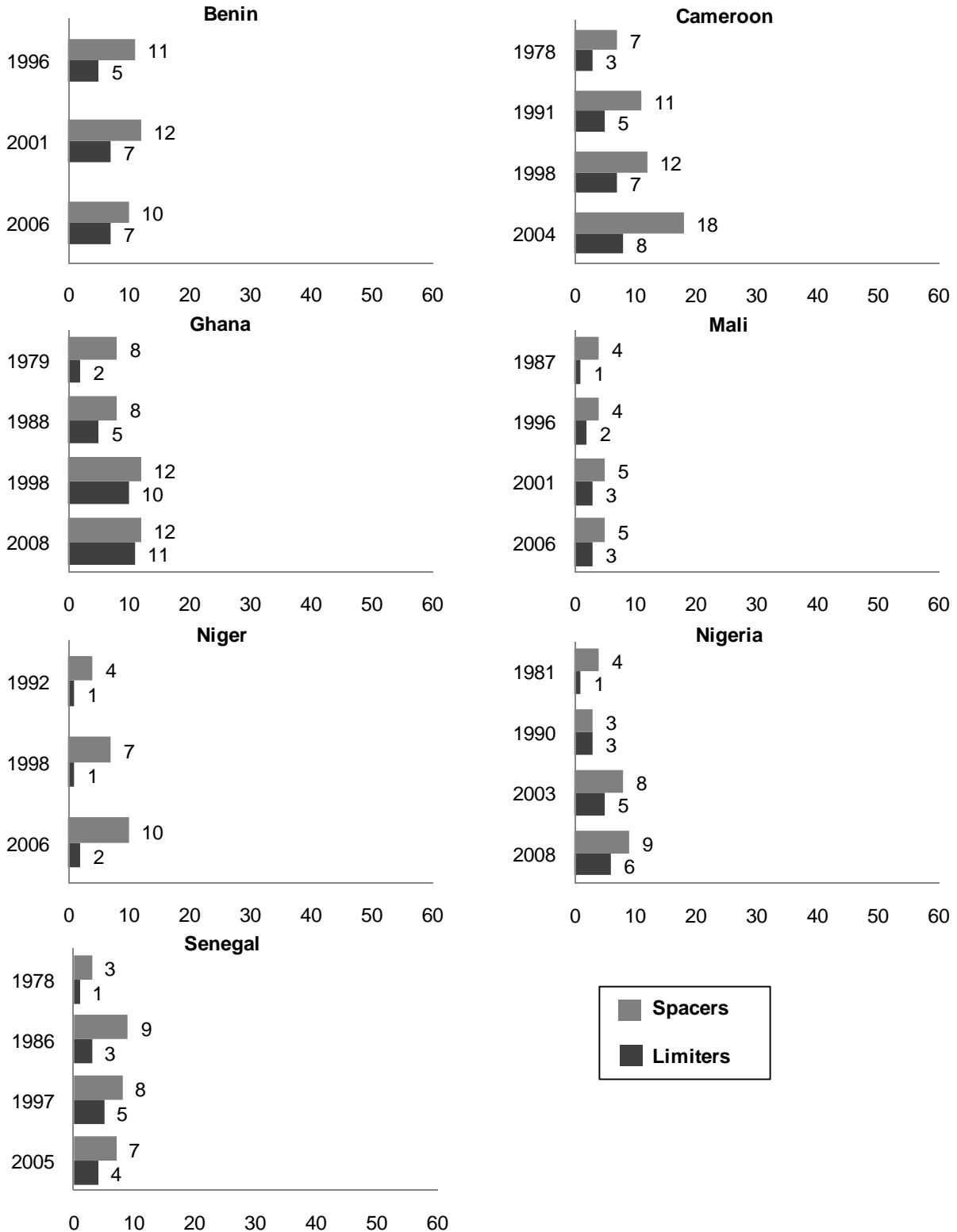


Figure 5 (continued). Trends in the current use of contraception for spacing and for limiting births, for currently married women age 15–49.

Eastern and Southern Africa

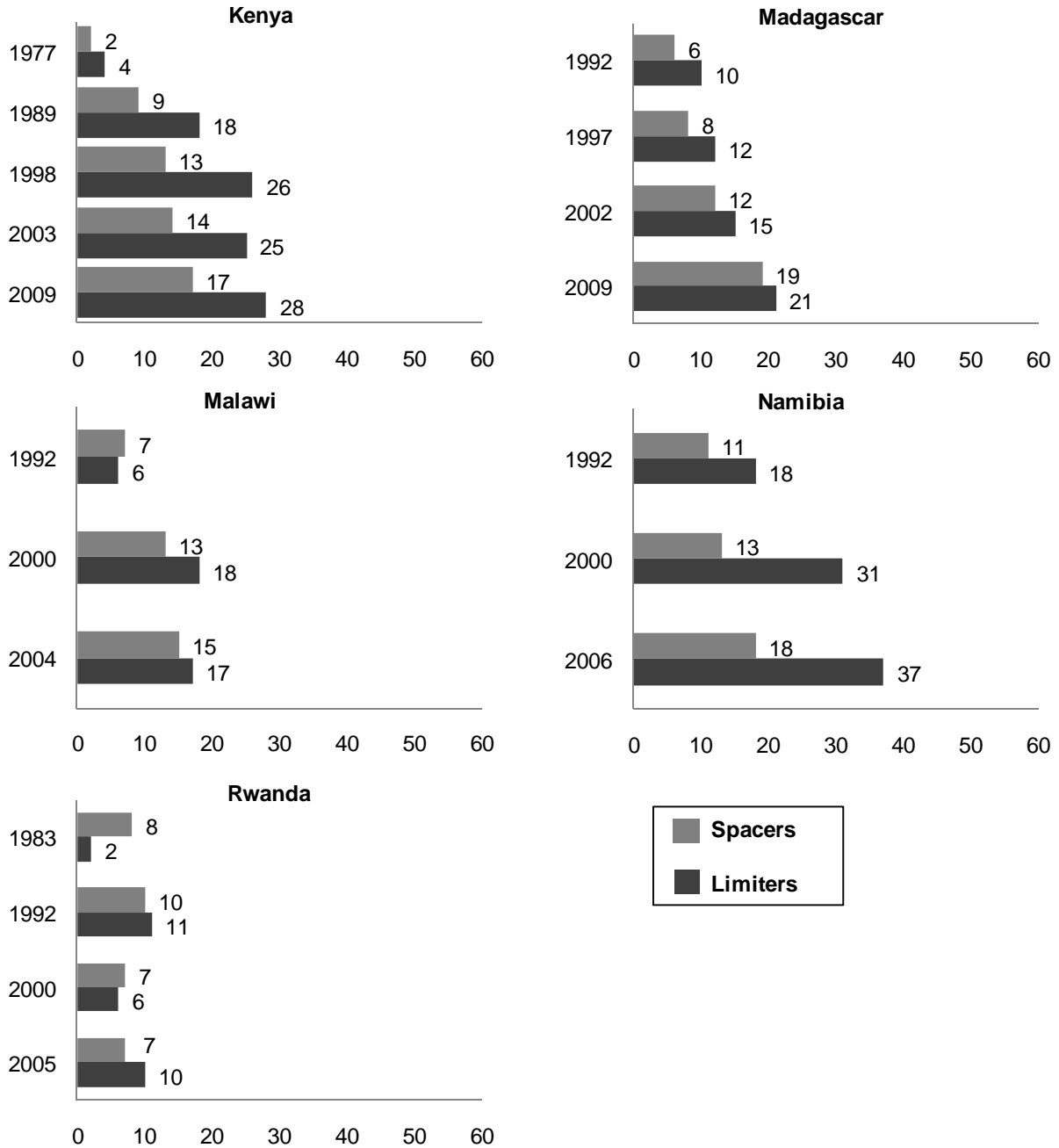
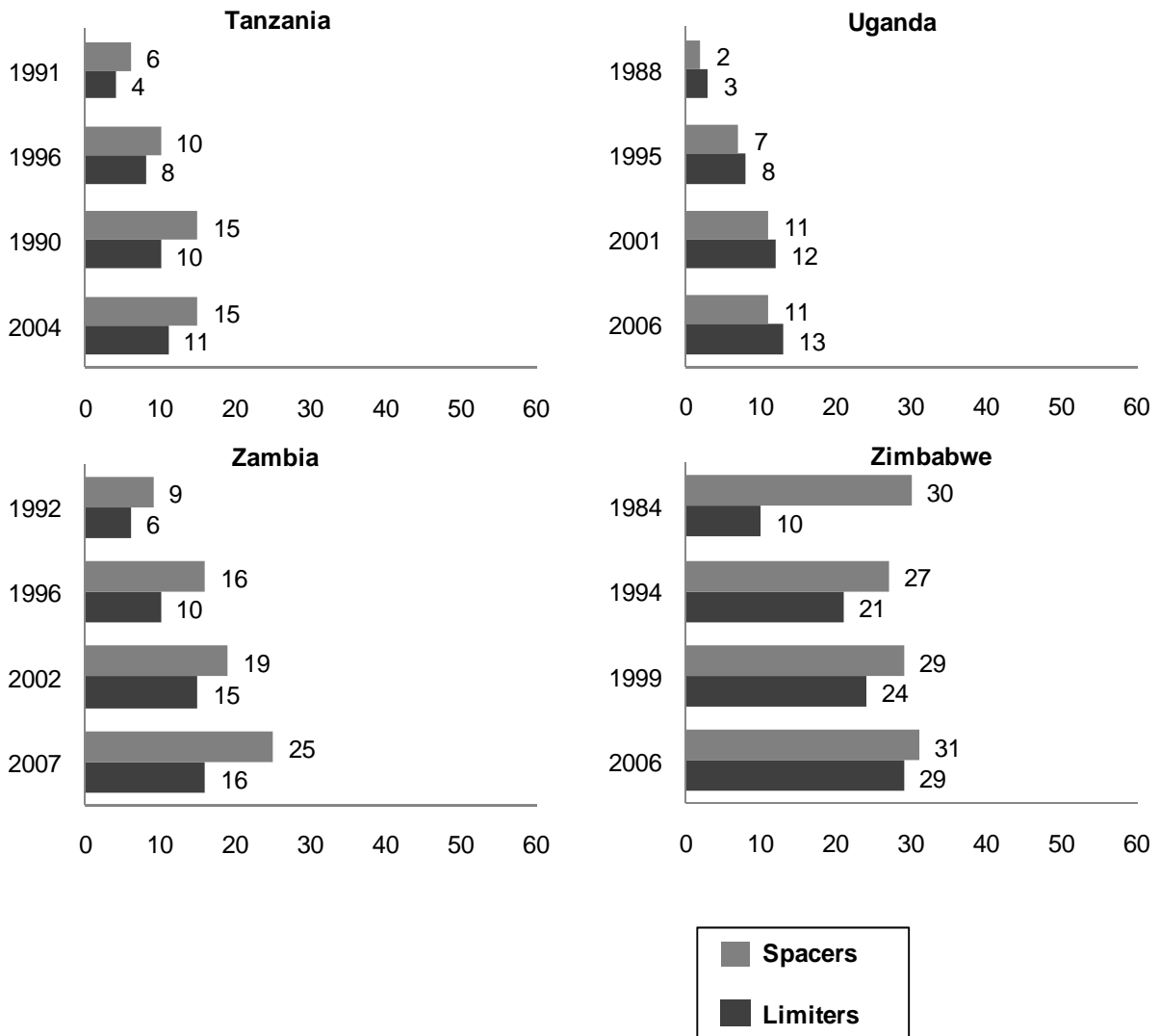


Figure 5 (continued). Trends in the current use of contraception for spacing and for limiting births, for currently married women age 15–49.



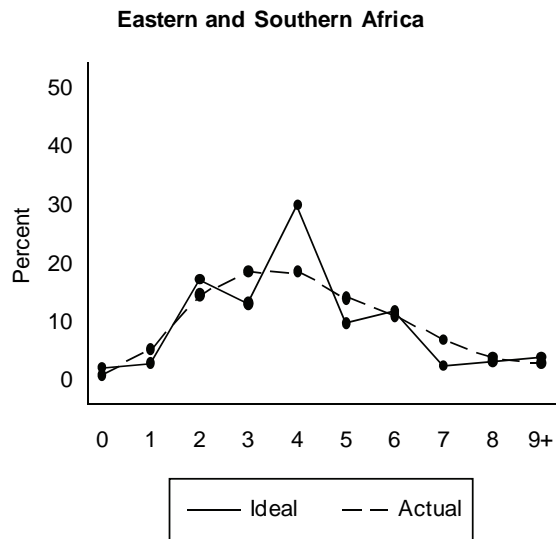
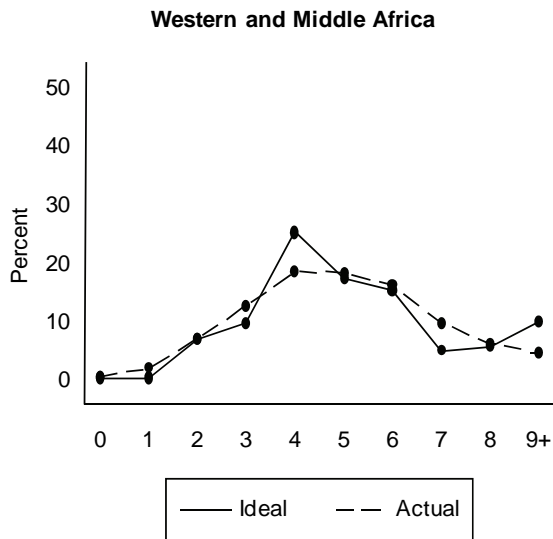
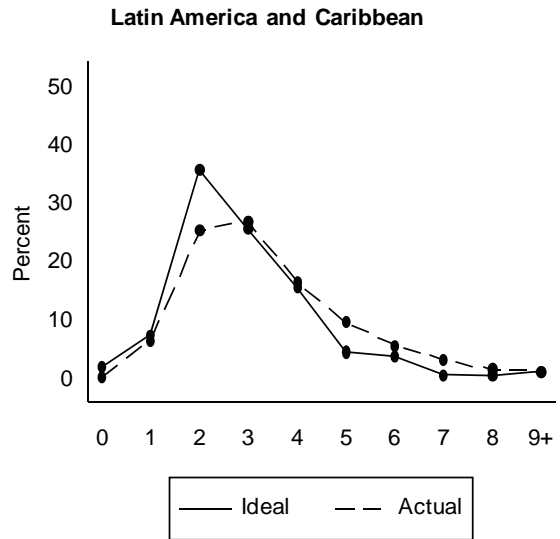
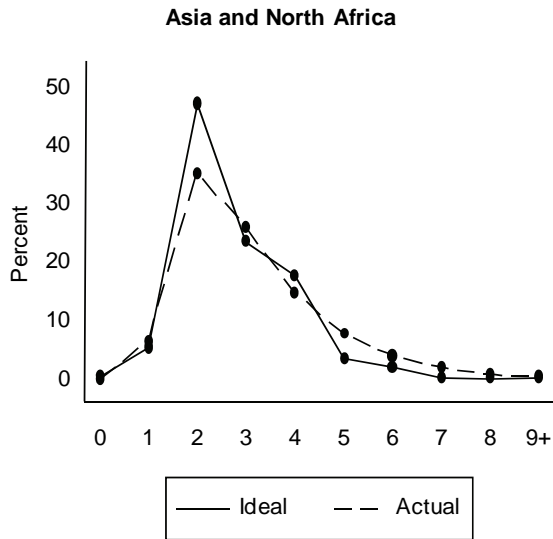
12. Discussion

This paper began with the observation that the fertility rate is much more responsive to the use of contraception for limiting births than to the spacing of births. In the fertility transition historically in the now developed countries, the methods of contraception then available plus abortion were typically used to terminate childbearing rather than to space earlier births. In more recent times, due in part to the efforts of organized family planning programs, the emphasis has focused on health rationales rather than on fertility rates, expressed in terms of promoting the health of mothers and children by extending the lengths of birth intervals. This is one of the reasons that contraceptive use for spacing dominates in sub-Saharan Africa. Another reason is that their desired family size is high. This led to the question of whether use for spacing leads to use for limiting, the main focus of this study.

The short answer to this question is that somewhat more than half of Limiters have been Spacers. The remaining Limiters had used no contraception until they had reached the number of children desired, a pattern similar to the earlier transition history. The program question of whether introducing contraception for spacing purposes is a bridge to later use for limiting certainly seems plausible. What remains unanswered is whether earlier experience with spacing generates a reduction in the number of children desired. The evidence we have reviewed here does not speak to that question directly but there is some indirect evidence that Limiters with prior spacing experience tend to want fewer children than Limiters who have not been Spacers. Of course, we have shown many differences between these two groups that might explain this. One salutary effect of spacing that we can infer is a significant reduction in child mortality.

Appendix

Percent distribution of two measures of number of children desired by married women using contraception who want no more children.



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