Chapter 8

Future Use of Sterilization

Highlights:

- The prevalence of sterilization will rise substantially in the next 15 years in many countries, as part of a rise in overall contraceptive use, and the absolute number of users will increase as well, due both to climbing prevalence and to growing populations.
- Between 2000 and 2015, sterilization prevalence is likely to grow in many countries in Latin America and the Caribbean. Levels will remain highest in Brazil, and are likely to increase modestly in such countries as Argentina, Chile, Colombia, Cuba, Ecuador, and Peru. The very high levels of sterilization seen currently in the Dominican Republic probably will decline as temporary methods take a larger share of overall contraceptive use.
- In Sub-Saharan Africa, where sterilization prevalence now is relatively low, usage is expected to rise along with contraceptive use in general. Sterilization prevalence is expected to rise substantially in Botswana, Kenya, South Africa, Tanzania, and Zimbabwe. Ghana and Nigeria, which currently have a low level of sterilization prevalence, can expect to see it rise modestly.
- Sterilization prevalence in most Asian countries is projected to remain stable or decline slightly, but is likely to fall substantially in China, India, and the Republic of Korea, where prevalence currently is highest. Bangladesh and Pakistan, where sterilization prevalence is moderate, will see a more modest decline over the 15-year period. However, prevalence is expected to rise modestly in Vietnam and more dramatically in the Philippines between 2000 and 2015, and Indonesia is expected to experience a slight rise in prevalence.

Today, more than one-fourth of the world's 6 billion people are between the ages of 10 and 24, making this the largest group ever to enter adulthood (PRB, 2000). This "critical cohort"—86% of whom live in developing countries—will determine the shape and size of the world's future population through their fertility decisions during their reproductive years. While the total fertility rate is declining in many regions of the world, population momentum necessitates that family planning programs adjust and expand to meet the needs of the growing population. In addition to offering comprehensive family planning services, programs must consider the need to adopt a life-cycle approach, with education for young people about sexual and reproductive health and a range of temporary and permanent contraceptive methods that may be appropriate for them during different stages of their lives. No doubt, female and male sterilization will become a contraceptive choice for many of these individuals in the future.

This chapter examines the changing definition of unmet need for contraception, the global demand for sterilization through a look at projections of future sterilization prevalence, and the characteristics of potential sterilization users. Though future sterilization use in a particular country may be altered by unpredictable factors, such as a change in the legal status of sterilization, the development of new methods, or economic circumstances affecting family planning programs, the estimates presented here should be useful for those who are planning and managing family planning services.

Unmet Need for Contraception

The concept of an unmet need for contraception emerged in the 1960s from the results of family planning knowledge, attitude, and practice (KAP) surveys, which indicated that a considerable number of women who wanted to stop childbearing were not practicing contraception. The definition of unmet need for family planning used in the Demographic and Health Surveys (DHS) is as follows:

> A currently married/in union, fecund woman can be defined to have unmet need for family planning if she says she would prefer either to postpone her next pregnancy by at least two years from the time of the survey or [to] avoid having any more children and is not using any method of family planning; or she is pregnant or amenorrheic postpartum, the current or recent pregnancy was mistimed or unwanted, and she was not using any method of family planning at the time she conceived (Westoff & Ochoa, 1991).

While this definition has been used to measure levels of unmet need worldwide, it has been criticized as a construct that is derived from large-scale surveys but that misses several key elements in addressing the issue of unmet need. Critics assert that it represents a mechanistic approach to fertility regulation that excludes important categories of women from consideration (e.g., women using a less-effective method, those using a theoretically effective method incorrectly, and sexually active unmarried women, who are normally excluded from these surveys[1]) and is not a direct measure of women's self-defined need for family planning services (Bongaarts & Bruce, 1995; Dixon-Mueller & Germain, 1992; Yinger, 1998). Thus, to capture the broad range of women who can be classified as having an unmet need, as well as to achieve a greater understanding of the underlying causes for this need, qualitative and quantitative research methodologies for measuring unmet need for contraception have had to become increasingly refined.

A modified definition of unmet need presented by Yinger (1998) reflects the array of risks of unintended pregnancy rather than the risk from nonuse of family planning alone. Since unintended pregnancies result from method failure, incorrect use of methods, use of highly ineffective methods, and nonuse of methods, a continuum of risk is proposed that includes each of these cases, in categories ranging from low risk to very high risk. Also considered in the continuum are factors such as contraceptive dissatisfaction and future intended use. As a result of the adoption of the more inclusive definition of unmet need, women who are classified as having a "met" need at the time of measurement, yet who may have a subsequent unmet need (e.g., due to contraceptive discontinuation), are included in the continuum. This broader characterization of unmet need moves beyond the dichotomous measure of contraceptive use or nonuse to take into account the multiple pathways that can lead women to an unintended pregnancy (Supplement 8.1, page 193).

Until recently, studies have focused exclusively on the unmet needs of women. Policy formation and program development in many countries have relied on fertility and family planning data collected from women. However, as current research suggests, women and men do not necessarily have similar fertility attitudes or goals (Bankole & Singh, 1998; Becker, 1999; Klijzing, 2000; Ngom, 1997; Wolff, Blanc, & Ssekamatte-Ssebuliba, 2000). The decision to stop childbearing by using contraception often occurs as a result of a complex decision-making process, with results that may not reflect consensus between partners. In some countries or social groups, the male partner has greater influence on the decision, while in other areas, the female partner's fertility preference exerts a stronger influence on the couple's contraceptive behavior (Bankole & Singh, 1998). The decision likely varies by time and location, and depends on several factors, including cultural norms, communication, and amount of negotiation (Wolff et al., 2000). A failure to include men in family planning efforts may have serious conse-

[1] The reproductive health surveys carried out by the Centers for Disease Control and Prevention include an analysis of unmet need that encompasses all women (Morris, 2001).

quences for the level of unmet need for contraception in developed and developing countries alike (Cohn & Burger, 2000).

The concept of men's unmet need for contraception has been introduced through research in Ghana and Kenya that utilized DHS data to analyze unmet need among men and couples (Ngom, 1997). Couples' unmet need is measured as the proportion of *marital* pairs with at least one partner having an unmet need for contraception. Married men were found to have levels of unmet need slightly lower than those of women (Ngom, 1997). In contrast, an aggregate-level study on unmet need in Europe comparing the fertility preferences and contraceptive behavior of men and women in 10 countries (Klijzing, 2000) showed that men and women had differing levels of unmet need, with men having generally higher levels. A study that calculated unmet need among wives, husbands, and couples in Bangladesh, the Dominican Republic, and Zambia found a substantial difference in estimates of unmet need between the three groups (Becker, 1999). Researchers from all of these studies posit that the discrepancies between the unmet need of men and women lie with disagreement or lack of communication about reproductive goals or contraceptive use among couples. This issue, along with several others not related to access, has not conventionally been included in the discussion of unmet need for contraception.

Whereas the traditional interpretation of unmet need focused on access to contraceptive services and supplies as the main barrier to the use of family planning, research findings suggest that the principal reasons for nonuse are lack of knowledge, fear of side effects, and social or familial disapproval (Bongaarts & Bruce, 1995). Additional research concentrating on women's perceptions of unmet need supports these findings and puts forward a multifaceted approach to understanding the causes for the gap between contraceptive need and use. Several issues that should be considered in the effort to refine the concept of unmet need and enhance its utility at the country level include informed choice, fears and rumors about contraceptive methods, sociocultural issues, and gender subordination as factors in contraceptive decision making among couples, as well as quality of care (Yinger, 1998).

Many of the issues that have emerged from recent studies on unmet need for contraception can be applied specifically to the unmet need for contraceptive sterilization to limit births. It is important to bear in mind the underlying causes of unmet need when considering the projected demand for sterilization. Countries that are able to address some of the key issues surrounding unmet need will likely experience a greater increase in demand for sterilization than will countries with policies that remain stagnant.

Projections of Future Sterilization Prevalence

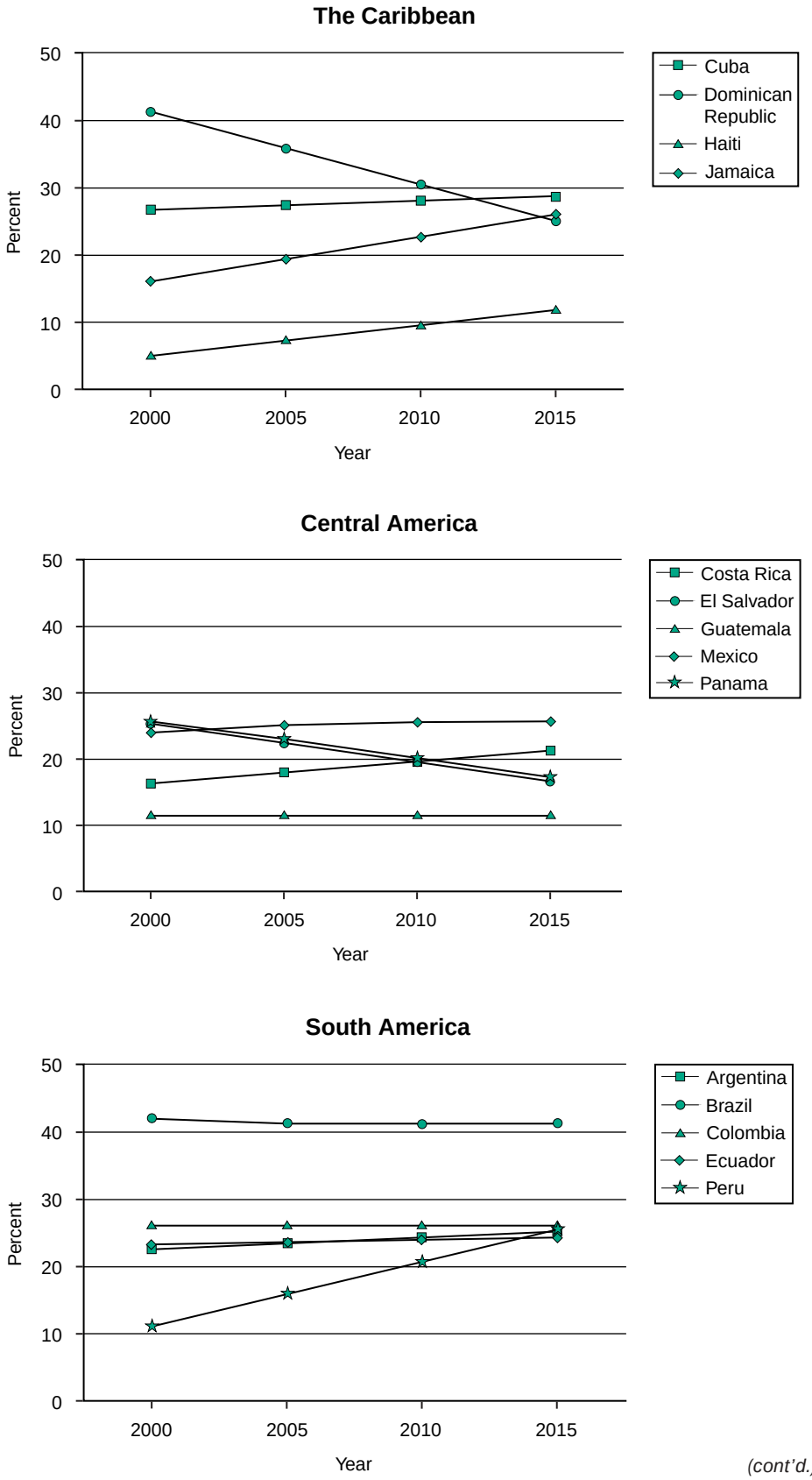
The projections of the future prevalence of sterilization that are presented in this chapter derive from a method relating sterilization increases to total contraceptive use, which in turn is based on United Nations (UN) projections of fertility change. The data have been obtained from a previously published monograph (Ross, Stover, & Willard, 1999).

The data presented here on the estimated future prevalence and numbers of female and male sterilization users are displayed by region. Supplement 8.2 (page 194) shows the projected prevalence for women in 2000, 2005, 2010, and 2015, while Supplement 8.3 (page 197) presents similar information for the male partners of women. Figure 8.1 (page 182) displays the projected trend in total sterilization prevalence (both women and men) for selected countries in each of the world's regions, highlighting both countries with high sterilization prevalence and countries with large populations.

Because recent trends for the more developed countries have been relatively stable, we did not generate projections of future sterilization prevalence for them. Sterilization prevalence in the next 15–20 years is not likely to differ dramatically from the level seen today in these countries, although the numbers of sterilization users may increase simply as a factor of population growth.

In many countries, the prevalence of sterilization will rise substantially in the next

Figure 8.1. Projected total percentage of couples using sterilization, by year, according to region



(cont'd.)

Figure 8.1. Projected total percentage of couples using sterilization, by year, according to region *(cont'd.)*

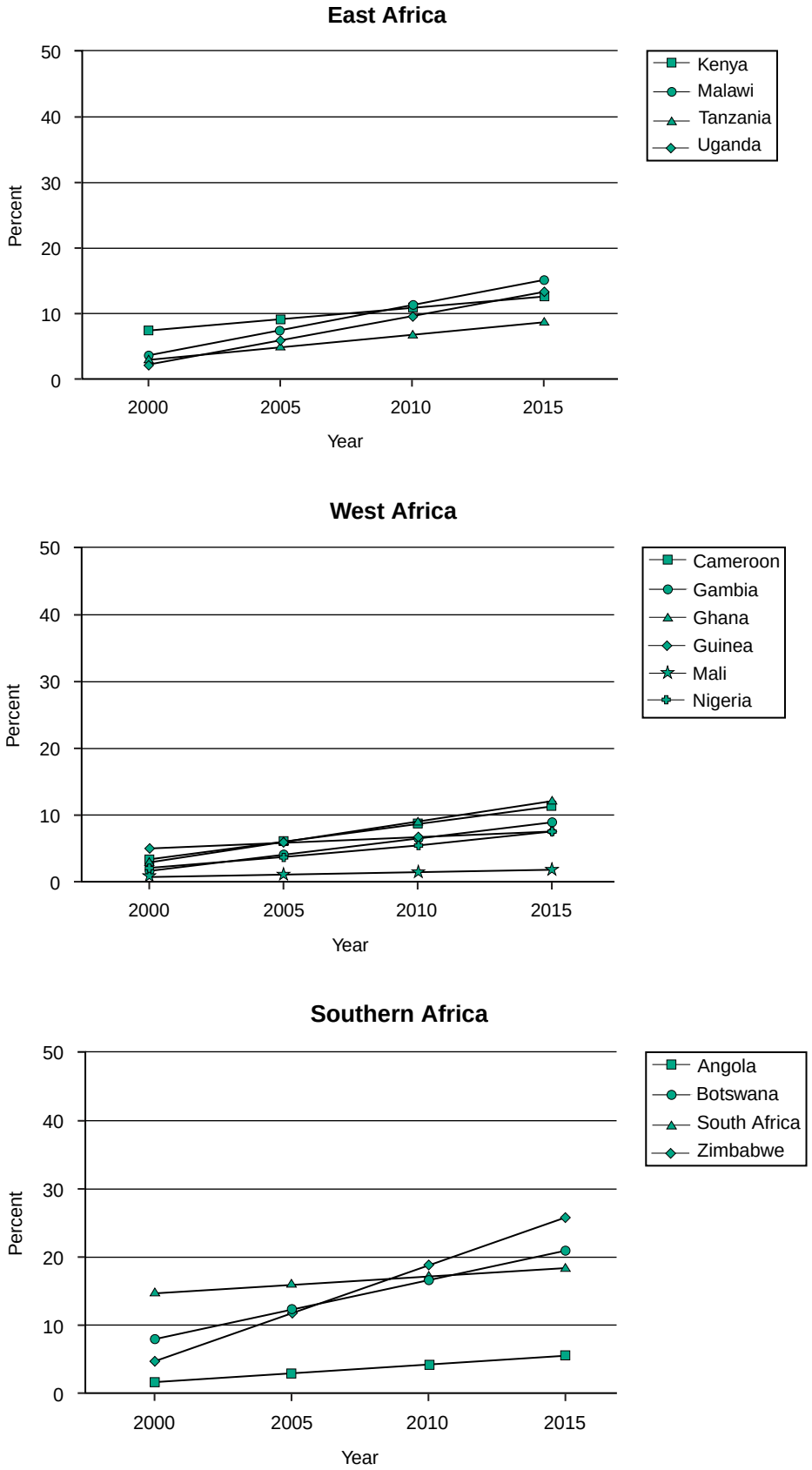


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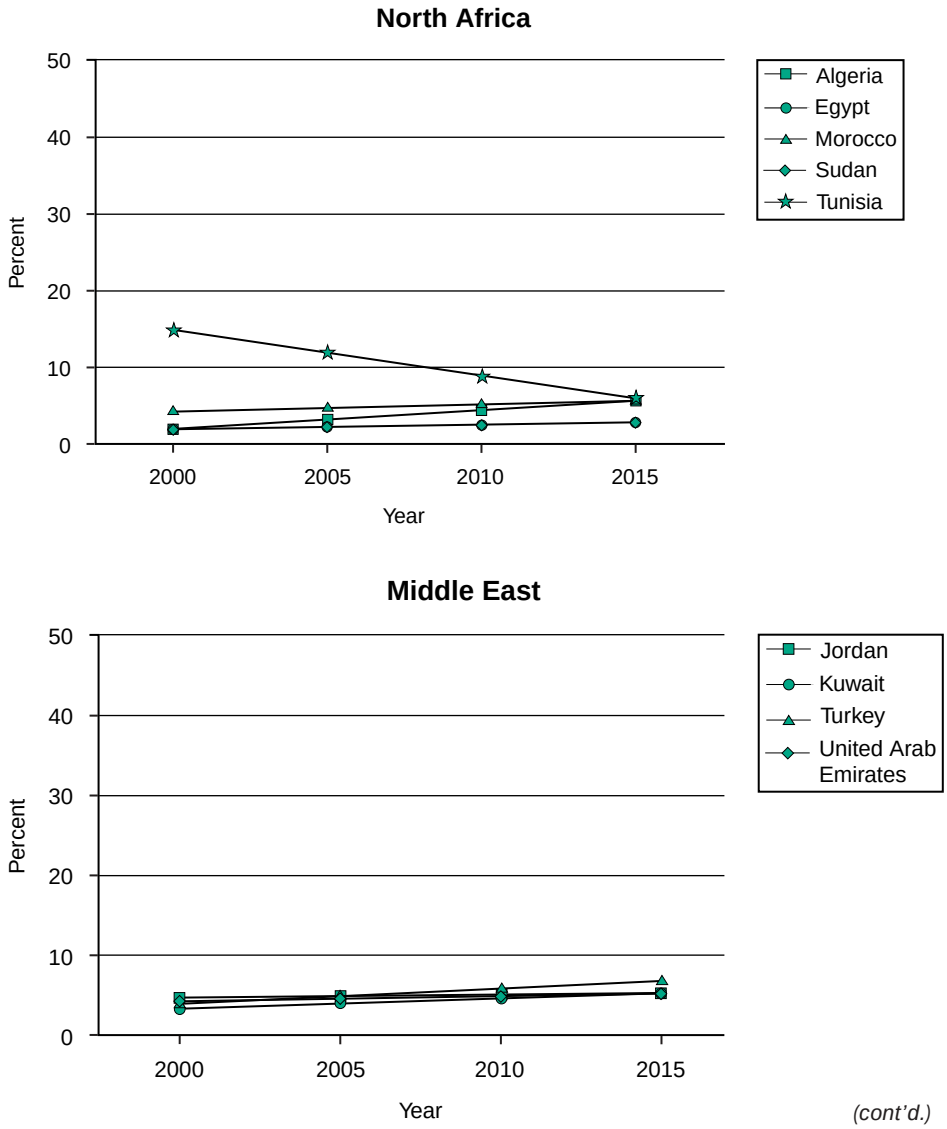
Figure 8.1. Projected total percentage of couples using sterilization, by year, according to region *(cont'd.)*



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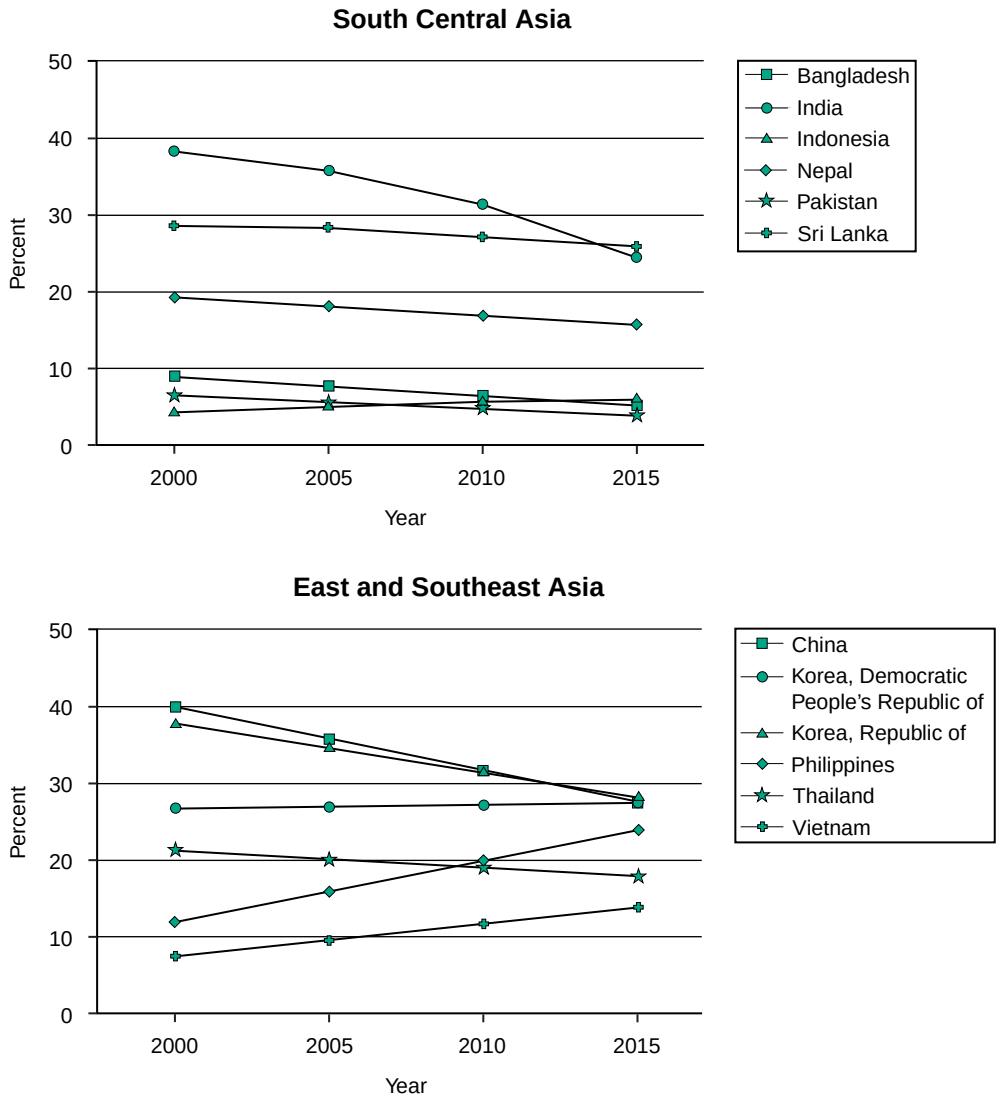
15 years, as part of a rise in overall contraceptive use. The numbers of users will rise as well, due both to increasing prevalence and to population growth. Prevalence may rise especially in countries with a changing age distribution—where the age distribution shifts in favor of the high-sterilization age-groups (centered on age 30, the mean age of sterilization in countries with high sterilization use). In countries where sterilization's prevalence has been high for decades, use may remain level or even decline slightly, as temporary methods become more prominent. Declines are seen where sterilization prevalence is historically high in the population of reproductive age and where the oldest cohort of sterilization users will be aging out of the population of reproductive age at a higher rate than the younger age-groups adopt the method.

The projected trend in sterilization prevalence between 2000 and 2015 for selected countries in Latin America and the Caribbean (Figure 8.1) is that it will remain highest in Brazil, leveling off at slightly above 40%. Most other countries in the region (including Argentina, Chile, Colombia, Cuba, and Ecuador) are likely to experience a modest increase in sterilization prevalence over the 15-year period, with levels rising to approximately 25–30% by 2015. Peru, like other Latin American countries with currently low reliance on sterilization, is expected to more closely resemble its neighbors in ster-

Figure 8.1. Projected total percentage of couples using sterilization, by year, according to region *(cont'd.)*



ilization prevalence by 2015 (with an increase from roughly 10% to 25%). The very high levels of sterilization in the Dominican Republic (more than 40% in 2000) reflect past prosterilization policies and a high demand for the method (Portes, 1983; Potter, 1986), but sterilization prevalence there is expected to decline as temporary methods take a larger share, so that levels of sterilization eventually resemble those seen in some neighboring countries.

In Sub-Saharan Africa, the prevalence of sterilization, particularly of male sterilization, is relatively low. However, sterilization usage is expected to rise along with contraceptive use in general. As shown in Figure 8.1, in 2000 the three countries in the region with the highest sterilization prevalence were South Africa (almost 15%) and Botswana and Kenya (roughly 7% each). Prevalence in these countries is expected to rise to between 13% and 20% by 2015, with the use level expected to be particularly high in Botswana. Sterilization prevalence is expected to rise dramatically in Zimbabwe over the same period, from approximately 5% to 25%, a change driven partly by its rapid population growth. Tanzania will likely experience a more moderate rise in sterilization prevalence (of about six percentage points). Ghana and Nigeria currently have a low level of sterilization prevalence but are expected to see it rise modestly, to 8% and 12%, respectively.

In North Africa and the Middle East, sterilization prevalence has historically been low everywhere but in Tunisia and is not expected to rise dramatically in the next 20 years. The projected trend for most countries in the regions, shown in Figure 8.1, is a modest increase in prevalence over the 15-year period, to a median level of roughly 5% in 2015. Tunisia is an exception to this projected trend: Under the projection methodology, its sterilization prevalence declines as total contraceptive prevalence rises and the use of other methods increases, especially among younger women.

In the former Soviet republics, including the Caucasus, the Central Asian republics, Moldova, Russia, and Ukraine, the prevalence of sterilization is projected to converge to roughly 25–30% in 2015 (data not shown), although current prevalence is low, at less than 5% (see Chapter 2). Under the projection methodology, the Central Asian republics of Kazakhstan, Tajikistan, and Uzbekistan, as well as Moldova and Russia, may see a marked rise in sterilization prevalence *if* there is a change in public interest in the method and *if* access to services is expanded. Under the projection methodology, the rise in sterilization prevalence follows the course taken by total contraceptive prevalence. The lower the initial contraceptive prevalence estimate, the more marked a rise in sterilization prevalence is expected.

In Asia, where sterilization has for decades been the most commonly used contraceptive method, sterilization prevalence for most countries is expected to remain level or to decline slightly. Sterilization accounted for roughly 40% of modern method use in 2000 (Ross et al., 1999). Prevalence was highest in China, India, and the Republic of Korea in 2000 and is expected to decline substantially by 2015, to an estimated 25%, in the end matching the level expected in both Koreas and Sri Lanka (Figure 8.1).[2] Countries such as Bangladesh and Pakistan, where sterilization prevalence is moderate, will see a more modest decline over the 15-year period.

Vietnam and the Philippines represent countries that are exceptions to the trend of decreasing prevalence seen in the region: Between 2000 and 2015, prevalence is expected to rise modestly in Vietnam, from roughly 7% to 14%, and more dramatically in the Philippines, from slightly more than 10% to 25%. Indonesia is expected to experience a slight rise in prevalence (of about one percentage point). In these cases, the increases are driven, under the projection methodology, by lower initial estimates of sterilization prevalence. In general, sterilization prevalence in Asia is projected to converge to between 15% and 30% overall. Even where prevalence may decline, however, the absolute numbers of sterilization users will nevertheless increase, due to projected population growth (see Supplements 8.2 and 8.3).

Characteristics of Potential Sterilization Users

Examining characteristics in order to monitor trends in sterilization use is essential for adapting sterilization and family planning programs to the changing needs of users. Chapter 3 examines selected characteristics of current sterilization users, such as age at sterilization (including trends over time), level of education, residence, and previous use of modern contraceptive methods. In this section, we examine selected characteristics of women who are currently in union, are fecund, and want no more children who may adopt sterilization in the future. Knowledge of the profiles of potential sterilization users can be used to estimate future sterilization demand, as well as to improve the quality of sterilization education and services.

The data in Table 8.1 are derived from nationally representative population-based surveys conducted by the Demographic and Health Surveys (DHS) project and the U.S. Centers for Disease Control and Prevention (CDC) of women of reproductive age. Three

[2] China and the Republic of Korea show marked declines in prevalence for two reasons: First, under the projection methodology, the proportion of the total contraceptive prevalence taken up by sterilization is less at the highest levels of prevalence; additionally, prevalence is estimated using UN projections of the total fertility rate, which in China and the Republic of Korea are expected to reverse direction in the future (Ross, 2000).

Table 8.1. Percentage distribution of fecund women aged 15–49 currently in union and wanting no more children, by selected characteristics, according to potential sterilization use and country

	Age		No. of living children			Level of education		Residence		Modern method use	
Country/year/source	<30	≥30	0–2	3–4	≥5	≤primary	≥secondary	Urban	Rural	Ever used	Never used
Nonusers considering sterilization											
Egypt, 1995–1996 (DHS)	24.5	75.5	26.4	34.5	39.0	77.4	22.6	44.6	55.4	76.5	23.5
Ghana, 1993–1994 (DHS)	15.6	84.4	3.1	31.3	65.6	96.9	3.1	31.3	68.8	12.5	87.5
Indonesia, 1997 (DHS)	25.2	74.8	20.3	57.0	22.7	59.5	40.5	41.2	58.8	66.1	33.9
Kenya, 1998 (DHS)	25.8	74.2	8.0	27.7	64.4	79.0	21.0	10.2	89.8	35.1	64.9
Moldova, 1997 (CDC)*	50.0	50.0	58.3	41.7	0.0	0.0	100.0	33.3	66.7	75.0	25.0
Morocco, 1992 (DHS)	7.3	92.7	4.4	20.4	75.2	95.6	4.4	37.2	62.8	78.8	21.2
Peru, 1996 (DHS)	33.6	66.4	31.1	38.1	30.8	51.0	49.0	60.0	40.0	28.4	71.6
Philippines, 1998 (DHS)	44.8	55.2	37.4	34.6	28.0	31.1	68.9	53.8	46.2	58.2	41.8
Tanzania, 1996 (DHS)	10.0	90.0	1.8	11.3	86.9	98.6	1.4	15.2	84.8	15.0	85.0
Zimbabwe, 1994 (DHS)	3.5	96.5	4.6	25.4	70.0	84.4	15.2	33.3	66.7	83.9	16.1
Users of temporary methods											
Egypt, 1995–1996 (DHS)	21.9	78.1	18.6	50.1	31.3	67.1	32.9	54.3	45.7	67.2	32.8
Ghana, 1993–1994 (DHS)	16.0	84.0	11.0	44.8	44.1	79.7	20.3	50.5	49.5	38.8	61.2
Indonesia, 1997 (DHS)	17.5	82.5	35.8	45.4	18.8	73.8	26.2	29.8	70.2	59.2	40.8
Kenya, 1998 (DHS)	28.5	71.5	19.7	40.0	40.2	60.6	39.4	25.3	74.7	56.1	43.9
Moldova, 1997 (CDC)*	19.2	80.8	73.1	25.0	2.0	0.1	99.9	49.2	50.8	82.3	17.7
Morocco, 1992 (DHS)	14.4	85.6	11.3	34.7	54.0	86.3	13.7	57.2	42.8	90.7	9.3
Peru, 1996 (DHS)	30.7	69.3	35.9	41.3	22.7	46.3	53.7	70.8	29.2	38.4	61.6
Philippines, 1998 (DHS)	24.7	75.3	24.5	45.6	29.9	34.3	65.7	50.5	49.5	51.6	48.4
Tanzania, 1996 (DHS)	27.1	72.9	16.6	30.8	52.6	92.4	7.6	38.3	61.7	57.1	42.9
Zimbabwe, 1994 (DHS)	22.8	77.2	14.3	29.5	56.2	71.9	28.1	37.2	62.8	90.6	9.4
Other nonusers											
Egypt, 1995–1996 (DHS)	29.0	71.0	26.5	34.6	38.9	79.9	20.1	38.7	61.3	45.7	54.3
Ghana, 1993–1994 (DHS)	19.1	80.9	13.8	33.9	52.3	95.7	4.3	28.4	71.6	19.3	80.7
Indonesia, 1997 (DHS)	12.5	87.5	29.5	37.7	32.8	82.2	17.8	27.0	73.0	39.3	60.7
Kenya, 1998 (DHS)	31.9	68.1	17.6	29.8	52.6	82.3	17.7	15.5	84.5	22.7	77.3
Moldova, 1997 (CDC)*	25.6	74.4	74.4	22.6	3.1	0.0	100.0	41.0	59.1	51.0	49.0
Morocco, 1992 (DHS)	20.7	79.3	14.9	28.2	56.9	95.4	4.6	34.9	65.1	49.3	50.7
Peru, 1996 (DHS)	36.9	63.1	36.5	30.2	33.3	65.8	34.2	49.8	50.2	19.2	80.8
Philippines, 1998 (DHS)	23.1	76.9	27.1	35.3	37.7	48.3	51.7	42.6	57.4	29.7	70.3
Tanzania, 1996 (DHS)	23.0	77.0	13.6	26.5	59.9	98.2	1.8	16.6	83.4	12.5	87.5
Zimbabwe, 1994 (DHS)	16.8	83.2	14.5	25.3	60.2	83.4	16.6	22.8	77.2	52.9	47.1

*Data refer to ages 15–44.

categories of potential sterilization users—falling on a crude continuum from most-likely to least-likely candidates—can be identified from the survey data (Rutenberg & Landry, 1993).

The first category consists of women who are in union, are fecund, and want no more children, but who are not currently using a contraceptive method. These women intend to use a contraceptive method in the future, and have stated that sterilization is their preferred method. These women have the greatest potential to adopt sterilization in the near future.

The second category is composed of women who are in union, are fecund, want no more children, and are using either a temporary modern method or a traditional method. The women were not asked about future use of any other method, as they are obviously motivated to control their fertility by using some type of method. Many of these women may switch to sterilization to replace a temporary contraceptive method, or to improve upon a method that they have found to be ineffective.

The third category consists of women who are in union, are fecund, and want no more children, but who are not currently using a contraceptive method and do not intend to use sterilization. The women state that they either intend to use a method other than sterilization or that they do not intend to use any contraceptive method. Although the women in this group are less likely to choose sterilization than those in the other two groups, a great deal can be learned from these women, whose behavior seems contrary to their own expressed interests.

To illustrate the changing profiles of users in countries with increasing sterilization use, we focus the discussion and analysis of data on the characteristics of potential users in 10 selected countries whose sterilization prevalence is projected to increase between 2000 and 2015—Egypt, Ghana, Indonesia, Kenya, Moldova, Morocco, Peru, the Philippines, Tanzania, and Zimbabwe.[3]

The social and demographic characteristics examined in this section parallel those studied in Chapter 3. Data on the age and number of living children of potential users are useful for projecting the demand for sterilization, as well as for estimating demographic impact (Rutenberg & Landry, 1993). Identifying potential users' level of completed schooling is important for designing appropriate educational materials for the intended audience. For example, if literacy is low among potential users, educational materials and strategies to convey sterilization information to a low-literacy audience can be utilized. Information on the residence of potential users is an indicator of where to establish service-delivery points or where to focus outreach efforts and referral systems to increase access. Data on previous use of modern contraceptives is helpful in determining the scope of education and service provision needed to promote the use of temporary methods prior to permanent contraception.

To ascertain whether social and demographic characteristics vary between women with differing propensities to use a permanent method, we examine the characteristics of potential sterilization users in each of the three categories and compare the three groups. The specific characteristics studied include current age (younger than 30 or 30 and older), the number of living children (0–2, 3–4, or five or more), residence (urban or rural), educational level (primary and less or secondary and higher), and previous use of a modern method (ever or never).

Nonusers considering sterilization

As stated earlier, we considered women to be potential sterilization users if they were in union, were fecund, wanted no more children, and were not currently using a contraceptive method, but if they were considering sterilization as their preferred contraceptive method.

[3] Countries with a projected decrease or a plateau in sterilization prevalence are not included in this discussion.

Age

In each country, at least half of women considering sterilization were 30 or older (Table 8.1). Since the median age at sterilization is greater than 30 in all but two of these countries (Moldova, at 27.9, and the Philippines, at 29.6), it is not surprising that the age of potential users approximates that of the median age at sterilization. When we compared current data with those from an earlier study (Rutenberg & Landry, 1993), the proportion of potential users older than 30 increased in countries with a projected rise in sterilization prevalence. This may be due to an increase in contraceptive method choice in these countries, which allows more women to use temporary methods prior to choosing a permanent method.

Number of living children

The number of living children among nonusers considering sterilization varied greatly among countries and regions (Table 8.1). In five countries (Ghana, Kenya, Morocco, Tanzania, and Zimbabwe), more than half of these women had five or more children, while in the remaining five (Egypt, Indonesia, Moldova, Peru, and the Philippines), the majority had four or fewer children. These differences generally reflect differences between the two groups of countries in past fertility levels.

In some countries, the proportion of women with higher numbers of children is greater among those who are considering sterilization than among those who have already been sterilized. This differential was notable in Ghana, Moldova, Tanzania, and Zimbabwe. For example, in Zimbabwe, 70% of women who wanted no more children and were considering sterilization had five or more children, compared with 58% of current sterilization users (not shown).

The opposite pattern can be seen in countries such as Egypt, Indonesia, Peru, and the Philippines, where women who are considering sterilization have fewer children than do those who have already been sterilized. In Egypt, 26% of potential users have 0–2 children, compared with only 4% of current sterilization users. In the Philippines, 37% of potential users have 0–2 children, compared with 13% of current users. While part of the difference in the number of living children between current sterilization users and potential users can be attributed to a general decline in desired family size, some of the difference may be because the number of living children at the time of the survey is an underestimation of the completed fertility of women who may be sterilized in the future (Rutenberg & Landry, 1993).

Educational level

Knowledge of the educational level of potential sterilization users is important in designing information and education messages for the appropriate audience. In several countries (including Egypt, Ghana, Kenya, Morocco, Tanzania, and Zimbabwe), more than 75% of women who wanted no more children and who were considering sterilization had a primary school education or less (Table 8.1). Many of these women were older than 30 at the time of the survey and lived in rural areas. In comparing current users and potential users, educational levels were lower among potential users in Ghana, Peru, Tanzania, and Zimbabwe than among current users (Supplement 3.1 and Table 8.1). In Egypt, Indonesia, Kenya, Moldova, Morocco, and the Philippines, educational levels within the two groups were approximately equivalent.

Residence

When sterilization services are initially introduced, they are generally concentrated in urban areas, where the necessary medical facilities and personnel are often located (Rutenberg & Landry, 1993). As sterilization techniques become simpler and outreach broadens, services are often extended to rural populations. With the exception of Peru and the Philippines, more than half of potential users in each of the selected countries lived in rural areas (Table 8.1).

In countries where rural residence is substantially higher among potential users than among current users, the need for improved access to sterilization in rural areas is great. In Morocco, for example, 63% of women considering sterilization live in rural areas, compared with 37% of current sterilization users. Similar patterns are seen in Egypt, Moldova, and Peru. In countries such as Kenya, sterilization services appear to be relatively accessible to rural populations, since a large proportion of both current and potential users of sterilization live in rural areas.

Ever-use of modern contraceptives

Ever-use of modern contraceptives among potential sterilization users varies widely across countries, as seen in Table 8.1. More than 75% of women considering sterilization in Egypt, Moldova, Morocco, and Zimbabwe have used modern contraceptive methods, while fewer than 30% of potential sterilization users in Ghana, Peru, and Tanzania have ever done so.

There is a notable differential in ever-use of modern methods (other than sterilization) between potential users and current users of sterilization in several of the countries. In Egypt, Indonesia, Moldova, Morocco, the Philippines, and Zimbabwe, the proportion of women who have ever used modern contraceptives is approximately 20% greater among those considering sterilization than among those currently sterilized. For example, 77% of potential users in Egypt have ever used modern methods, compared with 51% of current sterilization users. However, in Ghana, Kenya, Peru, and Tanzania, the proportion of women who have used modern contraceptives is lower among those considering sterilization than among those currently sterilized. In Ghana and Tanzania, for instance, 13% and 15%, respectively, of potential users have ever used modern methods, compared with 22% and 37% of current users. In Peru, this differential was slightly smaller, with 28% of potential users and 42% of current users having ever used modern contraceptive methods.

Users of temporary methods

Women who are in union, are fecund, want no more children, and are using either a temporary modern method or a traditional method may also be potential sterilization users. For most countries, data are not available on these women's intentions to use a permanent method in the future.[4] It is likely that some of these women will switch to sterilization to replace their temporary method after they have reached their desired family size, while others may have already reached their desired family size but are using a less-effective method.

As shown in Table 8.1, on average, users of temporary methods are slightly older and have fewer children than nonusers who are considering sterilization. In each of the selected countries except Peru, more than 70% of users of temporary contraceptive methods are older than 30.

Users of temporary contraceptive methods also appear to be more urban than are nonusers considering sterilization. Levels of previous modern contraceptive use are higher among temporary users. This suggests that urban residence may allow people to gain more information about and greater access to a range of modern contraceptive methods. In addition, women currently using a temporary contraceptive method have a higher level of educational attainment than do nonusers considering sterilization. This may be related to urban residence, and may further explain the women's greater experience with modern contraceptives.

[4] The exception is countries where the CDC has conducted reproductive health surveys. In these countries, all women, regardless of their contraceptive status, were asked about their intention to use other methods (including sterilization) in the future.

Other nonusers

The final category in our examination of potential users consists of women who are in union, are fecund, want no more children, are not currently using a contraceptive method, and do not intend to use sterilization. These women either are considering a method other than sterilization or are not considering any method. If they are sexually active and do not use a contraceptive method, it is likely that many who do not want more children will experience an unintended pregnancy.

There is no consistent trend in age within this category. In seven of the 10 countries, more than 20% of women are younger than 30 (Table 8.1) and presumably have several years of fertility ahead. In Ghana, Kenya, Morocco, Tanzania, and Zimbabwe, women in this category have fewer living children than nonusers considering sterilization. In Indonesia, Peru, and the Philippines, the opposite pattern is found, with greater numbers of living children among women in this category. Finally, women not using a method and not considering sterilization are more likely to live in rural areas, have the lowest levels of education, and have the least amount of previous modern contraceptive use.

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Supplement 8.1. Continuum of risk of unintended pregnancy, by level of risk, according to individuals' characteristics and needs associated with each level of risk

	Low risk		Moderate risk	High risk	Very high risk
Characteristics of individuals in each risk category	• Users of permanent methods	• Users of modern temporary methods—correct use • Users of traditional methods—correct use	• Users or partners who are dissatisfied with current method • Users or partners who are using modern or traditional methods incorrectly • Users or partners who are using highly ineffective methods	• Women who are currently not using a method but who have used one in the past and who state that they intend to use one in the future • Women who are not using a method but who have used one in the past and who do not know if they will use one in the future • Women who have never used a method but who state that they intend to use one in the future	• Women who have never used a method and who do not know if they will use one in the future • Women who have never used a method and who state that they do not intend to use one in the future
Needs of each risk category	• Continuing reproductive health services	• Continuing reproductive health services, including resupply of contraceptives, information, and support	• Higher quality reproductive health services (especially better counseling and management of side effects) • Research into the causes of dissatisfaction and method choice beyond service-delivery factors	• Research into the causes of nonuse and programs to address those causes (which often are not related to service delivery) • Better postpartum programs • Information, education, communication, and counseling	

Source: Adapted from Yinger, 1998.

Supplement 8.2. Projected percentage and number of women using sterilization in selected developing countries, by region, according to year

	2000		2005		2010		2015	
Country	**%**	**N (in 1,000s)**	**%**	**N (in 1,000s)**	**%**	**N (in 1,000s)**	**%**	**N (in 1,000s)**
Asia		**159,890**		**161,411**		**156,049**		**141,707**
Afghanistan	1.0	41	1.6	84	2.1	127	2.7	183
Bangladesh	7.8	2,137	6.9	2,141	6.0	1,982	4.9	1,747
Bhutan	0.3	1	1.2	4	2.3	9	3.6	17
Cambodia	2.2	178	4.5	243	7.1	318	10.3	405
China, People's Republic of	31.2	77,974	28.8	74,536	26.4	69,709	24.2	62,620
China, Republic of (Taiwan)	24.2	743	24.5	920	24.8	1,100	25.1	1,256
Hong Kong	23.2	259	24.4	274	25.6	271	26.8	261
India	34.0	63,870	31.5	66,537	27.6	64,429	22.3	56,114
Indonesia	3.6	1,397	4.4	1,825	4.9	2,166	5.4	2,442
Iran	10.7	1,375	9.0	1,326	7.1	1,168	5.2	896
Korea, Democratic People's Republic of	23.4	1,001	23.8	1,065	24.0	1,110	24.2	1,144
Korea, Republic of	27.2	2,248	26.3	2,180	25.4	2,034	24.5	1,877
Laos	5.6	44	7.7	70	9.8	104	11.9	145
Malaysia	9.0	307	7.9	299	6.6	274	5.1	227
Mongolia	20.6	96	21.9	118	22.5	131	22.8	138
Myanmar	7.9	857	13.2	1,279	16.7	1,538	18.5	1,681
Nepal	13.7	621	13.8	722	14.1	839	14.6	970
Pakistan	6.4	1,603	5.4	1,569	4.5	1,507	3.6	1,372
Papua New Guinea	10.0	74	12.1	102	14.3	136	16.7	177
Philippines	11.2	1,303	14.7	1,988	18.3	2,716	21.5	3,477
Singapore	19.2	111	20.6	117	22.2	122	24.2	126
Sri Lanka	24.8	771	24.7	801	24.1	794	23.5	780
Thailand	18.4	1,983	17.6	1,984	16.7	1,891	15.8	1,764
Vietnam	6.6	896	8.1	1,227	9.7	1,574	11.2	1,888
Latin America and the Caribbean		**25,413**		**27,512**		**29,203**		**30,424**
Argentina	20.0	1,160	21.0	1,294	21.8	1,423	22.5	1,547
Bolivia	5.9	74	10.4	161	14.9	260	19.2	377
Brazil	39.4	12,893	38.9	13,578	38.7	14,043	38.7	14,299
Chile	20.9	471	21.4	511	21.9	541	22.3	564
Colombia	25.7	1,951	24.9	2,049	24.1	2,126	23.2	2,154
Costa Rica	20.0	150	21.5	179	22.9	206	24.4	231
Cuba	22.8	430	23.7	451	24.5	466	25.4	451
Dominican Republic	40.9	640	35.0	597	28.6	519	22.1	415
Ecuador	21.0	438	21.6	500	21.9	553	22.0	595
El Salvador	33.6	416	29.8	408	25.5	384	20.9	343
Guatemala	16.4	303	16.3	352	16.1	406	15.6	458
Guyana	22.0	37	22.6	40	22.7	41	22.8	41
Haiti	4.5	63	6.7	106	8.9	155	11.0	210
Honduras	19.5	207	20.4	254	20.8	300	20.9	340
Jamaica	14.0	72	17.0	93	20.1	114	23.1	134
Mexico	22.9	4,013	23.0	4,386	22.8	4,643	22.4	4,788

(cont'd.)

Supplement 8.2. Projected percentage and number of women using sterilization in selected developing countries, by region, according to year *(cont'd.)*

Country	2000		2005		2010		2015	
	%	N (in 1,000s)	%	N (in 1,000s)	%	N (in 1,000s)	%	N (in 1,000s)
Latin America and the Caribbean *(cont'd.)*								
Nicaragua	26.8	238	27.7	284	27.9	333	27.5	376
Panama	36.5	191	32.2	183	27.6	167	22.8	143
Paraguay	7.8	70	11.5	119	15.3	178	19.0	247
Peru	10.6	454	14.8	700	18.8	966	22.7	1,235
Puerto Rico	43.5	277	37.1	240	30.2	198	23.7	157
Trinidad and Tobago	12.9	35	17.3	49	21.4	61	25.5	71
Uruguay	21.2	102	21.7	109	22.2	114	22.6	120
Venezuela	18.1	728	19.4	869	20.6	1,006	21.7	1,128
Middle East and North Africa		**1,557**		**2,145**		**2,745**		**3,355**
Algeria	1.5	70	2.7	144	3.9	232	5.1	327
Egypt	1.5	147	2.0	232	2.3	320	2.6	395
Iraq	2.5	82	2.9	114	3.3	151	3.8	195
Jordan	4.4	39	4.6	48	4.8	57	4.8	67
Kuwait	3.2	10	3.9	14	4.6	18	5.0	21
Lebanon	4.7	28	5.0	32	5.1	34	5.1	36
Libya	14.1	127	16.9	177	19.7	230	22.0	288
Morocco	3.6	150	4.3	197	4.8	230	5.0	255
Oman	7.0	24	5.8	25	4.6	24	3.3	20
Saudi Arabia	2.0	57	2.5	87	3.0	125	3.6	174
Sudan	1.7	83	2.1	112	2.5	149	2.9	195
Syria	2.7	68	3.3	103	4.0	142	4.7	185
Tunisia	14.9	217	11.9	190	8.6	144	5.1	89
Turkey	3.3	413	4.3	577	5.2	737	6.0	886
United Arab Emirates	4.1	15	4.4	18	4.8	21	5.0	24
Yemen	1.1	27	2.5	75	3.6	131	4.5	198
Sub-Saharan Africa		**3,147**		**6,553**		**11,000**		**16,765**
Angola	2.4	44	4.3	91	6.1	155	8.0	237
Benin	1.0	15	3.6	62	6.3	124	9.1	204
Botswana	6.9	14	10.8	24	14.7	36	18.5	51
Burkina Faso	0.7	19	1.3	41	1.9	71	2.6	111
Burundi	0.7	8	3.1	43	5.7	90	8.3	150
Cameroon	2.0	87	4.2	210	6.5	372	9.0	586
Central African Republic	1.0	8	3.4	32	5.9	61	8.6	100
Chad	0.3	5	0.7	13	1.3	26	1.9	46
Congo	4.4	17	6.2	27	8.0	42	9.8	60
Côte d'Ivoire	1.0	35	4.8	189	8.7	390	12.9	657
Eritrea	1.3	9	4.6	36	8.0	72	11.5	120
Ethiopia	0.7	91	1.8	252	3.1	504	4.6	876
Gabon	6.8	12	8.7	17	10.6	24	12.5	32
Gambia	1.2	3	3.5	12	5.9	22	8.4	36
Ghana	1.8	62	4.9	256	8.0	484	11.2	773

(cont'd.)

Supplement 8.2. Projected percentage and number of women using sterilization in selected developing countries, by region, according to year *(cont'd.)*

	2000		2005		2010		2015	
Country	**%**	**N (in 1,000s)**	**%**	**N (in 1,000s)**	**%**	**N (in 1,000s)**	**%**	**N (in 1,000s)**
Sub-Saharan Africa *(cont'd.)*								
Guinea	6.4	69	8.6	106	10.7	151	12.8	206
Guinea-Bissau	5.5	10	7.2	14	8.9	20	10.7	27
Kenya	6.7	338	8.5	492	10.0	648	11.6	826
Lesotho	9.1	47	10.5	60	12.0	76	13.5	97
Liberia	2.3	30	3.4	41	4.7	63	6.1	95
Madagascar	1.6	49	4.1	143	6.7	275	9.4	449
Malawi	4.1	84	8.5	199	12.7	346	16.4	521
Mali	0.6	15	1.0	32	1.5	56	2.0	90
Mauritania	1.0	4	1.3	6	1.7	9	2.0	12
Mauritius	8.2	20	13.5	34	18.8	49	24.2	61
Mozambique	1.0	50	1.9	104	3.0	179	4.3	288
Namibia	9.3	19	10.8	24	12.3	30	13.8	37
Niger	0.5	11	2.4	61	4.3	133	6.4	231
Nigeria	1.2	373	3.1	1,165	5.2	2,201	7.4	3,562
Rwanda	1.9	22	6.6	90	11.3	175	15.7	276
Senegal	1.0	18	2.9	64	5.0	127	7.2	212
Sierra Leone	4.4	32	6.2	51	8.0	74	9.8	103
Somalia	1.1	16	2.6	44	4.4	88	6.2	149
South Africa	13.1	1,012	14.2	1,151	15.1	1,275	16.0	1,403
Swaziland	5.4	11	7.9	18	10.5	28	13.1	39
Tanzania	2.6	173	4.4	344	6.3	563	8.2	845
Togo	1.1	12	4.6	60	8.1	124	11.6	206
Uganda	2.3	98	6.0	307	10.1	621	13.8	1,017
Zaire (Democratic Republic of Congo)	0.8	78	2.5	292	4.2	600	6.1	1,040
Zambia	3.0	47	6.4	116	9.8	207	13.3	325
Zimbabwe	3.8	80	10.0	230	16.3	409	22.3	609

Note: Includes all developing countries with a population of more than 1 million. Sterilization prevalence is the percentage of women aged 15–49 currently married or living in union who are currently using sterilization. Numbers of users include women not married or in union in countries where there is substantial use of sterilization among such women.

Supplement 8.3. Projected percentage and number of men using vasectomy in selected developing countries, by region, according to year

Country	2000		2005		2010		2015	
	%	N (in 1,000s)	%	N (in 1,000s)	%	N (in 1,000s)	%	N (in 1,000s)
Asia		**33,383**		**29,754**		**24,871**		**18,678**
Afghanistan	0.1	3	0.1	6	0.1	8	0.2	12
Bangladesh	1.1	303	0.9	266	0.6	199	0.3	117
Bhutan	0.1	0	0.1	0	0.1	0	0.1	0
Cambodia	0.1	12	0.3	20	0.5	31	0.7	44
China, People's Republic of	8.9	22,345	7.1	18,262	5.2	13,646	3.3	8,546
China, Republic of (Taiwan)	1.5	48	2.2	82	2.8	126	3.5	175
Hong Kong	1.1	12	2.0	22	2.9	31	3.9	38
India	4.2	7,970	4.0	8,395	3.5	8,246	2.9	7,320
Indonesia	0.8	294	0.6	267	0.5	212	0.3	147
Iran	1.1	147	0.9	132	0.6	103	0.3	60
Korea, Democratic People's Republic of	3.1	134	3.2	144	3.3	151	3.3	156
Korea, Republic of	10.6	879	8.3	686	5.9	469	3.4	258
Laos	0.2	1	0.4	4	0.7	7	0.9	12
Malaysia	0.3	9	0.3	11	0.3	13	0.3	15
Mongolia	2.6	12	2.8	15	2.9	17	3.0	18
Myanmar	2.8	382	3.0	373	2.9	294	2.1	201
Nepal	5.8	263	4.3	224	2.9	169	1.4	94
Pakistan	0.1	29	0.2	44	0.2	65	0.2	92
Papua New Guinea	0.7	5	1.0	9	1.4	13	1.8	19
Philippines	0.3	31	1.1	142	1.9	278	2.7	429
Singapore	0.7	4	1.4	8	2.3	13	3.3	17
Sri Lanka	3.9	120	3.7	119	3.4	113	3.2	105
Thailand	2.6	283	2.6	293	2.6	291	2.5	284
Vietnam	0.6	97	1.4	230	2.1	376	2.8	519
Latin America and the Caribbean		**1,712**		**2,153**		**2,615**		**3,085**
Argentina	2.4	142	2.6	164	2.8	183	3.0	203
Bolivia	1.2	16	1.6	24	1.9	33	2.3	44
Brazil	2.6	889	2.5	941	2.5	978	2.5	1,000
Chile	2.6	59	2.7	65	2.8	70	2.9	74
Colombia	0.9	66	1.6	134	2.3	211	3.1	293
Costa Rica	1.4	11	2.1	17	2.7	24	3.3	31
Cuba	3.5	66	3.5	67	3.5	67	3.6	63
Dominican Republic	0.3	4	1.1	20	2.0	37	2.9	54
Ecuador	2.0	42	2.3	53	2.6	65	2.9	76
El Salvador	0.6	7	1.3	17	2.0	28	2.6	42
Guatemala	1.7	32	1.7	37	1.7	42	1.6	48
Guyana	2.8	5	2.9	5	3.0	5	3.0	5
Haiti	0.3	4	0.5	8	0.6	11	0.8	16
Honduras	0.4	4	1.1	13	1.9	26	2.6	41
Jamaica	2.7	14	2.8	15	3.0	17	3.1	18
Mexico	1.1	192	1.7	326	2.3	471	2.9	619

(cont'd.)

Supplement 8.3. Projected percentage and number of men using vasectomy in selected developing countries, by region, according to year *(cont'd.)*

	2000		2005		2010		2015	
Country	**%**	**N (in 1,000s)**	**%**	**N (in 1,000s)**	**%**	**N (in 1,000s)**	**%**	**N (in 1,000s)**
Latin America and the Caribbean *(cont'd.)*								
Nicaragua	0.7	6	1.6	15	2.6	29	3.6	47
Panama	0.6	3	1.4	8	2.2	13	3.0	19
Paraguay	1.4	14	1.7	19	2.0	25	2.2	32
Peru	0.4	17	1.3	61	2.1	113	3.0	168
Puerto Rico	3.4	22	3.4	22	3.3	22	3.2	21
Trinidad and Tobago	0.5	1	1.5	4	2.6	7	3.6	10
Uruguay	2.7	13	2.8	14	2.9	15	3.0	16
Venezuela	2.1	83	2.3	104	2.6	123	2.8	145
Middle East and North Africa		**132**		**174**		**212**		**254**
Algeria	0.3	13	0.3	16	0.3	19	0.3	22
Egypt	0.3	27	0.3	36	0.3	44	0.3	50
Iraq	0.2	5	0.2	8	0.2	10	0.3	13
Jordan	0.3	2	0.3	3	0.3	4	0.3	4
Kuwait	0.2	0	0.3	1	0.3	1	0.3	1
Lebanon	0.3	2	0.3	2	0.3	2	0.3	2
Libya	1.3	12	1.9	19	2.4	28	2.9	37
Morocco	0.2	10	0.3	13	0.3	16	0.3	18
Oman	0.1	0	0.2	0	0.2	1	0.2	1
Saudi Arabia	0.1	4	0.2	6	0.2	8	0.2	12
Sudan	0.1	4	0.1	7	0.2	9	0.2	13
Syria	0.2	6	0.3	8	0.3	10	0.3	12
Tunisia	0.3	5	0.3	5	0.3	6	0.3	6
Turkey	0.3	39	0.3	43	0.3	46	0.3	48
United Arab Emirates	0.3	1	0.3	1	0.3	1	0.3	2
Yemen	0.1	2	0.2	6	0.2	7	0.3	13
Sub-Saharan Africa		**298**		**528**		**819**		**1,171**
Angola	0.1	2	0.2	4	0.3	7	0.4	10
Benin	0.0	0	0.2	3	0.3	7	0.5	11
Botswana	0.5	2	1.1	4	1.6	7	2.2	10
Burkina Faso	0.1	2	0.1	3	0.1	5	0.2	7
Burundi	0.1	1	0.2	3	0.3	4	0.4	7
Cameroon	0.1	5	0.2	12	0.4	21	0.5	32
Central African Republic	0.1	1	0.2	2	0.3	3	0.4	5
Chad	0.0	0	0.1	1	0.1	2	0.1	3
Congo	0.1	0	0.3	1	0.5	2	0.6	4
Côte d'Ivoire	0.2	5	0.5	18	0.8	35	1.1	57
Eritrea	0.2	1	0.4	3	0.6	6	0.9	9
Ethiopia	0.1	10	0.1	12	0.1	15	0.1	19
Gabon	0.2	0	0.5	1	0.8	2	1.1	3
Gambia	0.0	0	0.2	1	0.3	1	0.4	2
Ghana	0.1	6	0.4	19	0.6	36	0.8	57

(cont'd.)

Supplement 8.3. Projected percentage and number of men using vasectomy in selected developing countries, by region, according to year *(cont'd.)*

Country	2000		2005		2010		2015	
	%	N (in 1,000s)	%	N (in 1,000s)	%	N (in 1,000s)	%	N (in 1,000s)
Sub-Saharan Africa *(cont'd.)*								
Guinea	0.2	2	0.5	6	0.8	11	1.1	18
Guinea-Bissau	0.1	0	0.3	1	0.5	1	0.7	2
Kenya	0.6	34	0.8	52	0.9	70	1.1	91
Lesotho	0.5	3	0.7	4	1.0	6	1.2	9
Liberia	0.1	0	0.1	1	0.1	2	0.1	2
Madagascar	0.1	4	0.3	9	0.4	17	0.5	26
Malawi	0.2	4	0.7	17	1.3	33	1.8	53
Mali	0.0	1	0.1	2	0.1	4	0.1	6
Mauritania	0.0	0	0.0	0	0.1	1	0.1	1
Mauritius	0.4	1	1.4	3	2.3	6	3.3	8
Mozambique	0.1	5	0.1	5	0.1	6	0.1	7
Namibia	0.3	1	0.6	2	0.9	4	1.3	5
Niger	0.1	2	0.1	3	0.1	4	0.2	6
Nigeria	0.1	35	0.2	60	0.2	93	0.3	135
Rwanda	0.2	3	0.7	9	1.2	18	1.6	28
Senegal	0.1	2	0.2	3	0.2	5	0.3	8
Sierra Leone	0.1	1	0.3	2	0.5	4	0.6	7
Somalia	0.1	1	0.1	2	0.1	2	0.1	3
South Africa	1.6	126	2.0	160	2.3	194	2.6	229
Swaziland	0.4	1	0.6	2	0.9	2	1.1	4
Tanzania	0.1	8	0.2	18	0.4	32	0.5	48
Togo	0.1	1	0.3	4	0.6	9	0.9	16
Uganda	0.2	7	0.5	27	0.9	56	1.3	94
Zaire (Democratic Republic of Congo)	0.1	10	0.1	12	0.1	16	0.1	21
Zambia	0.2	3	0.5	9	0.8	18	1.2	29
Zimbabwe	0.4	8	1.2	28	2.1	52	2.9	79

Note: Includes all developing countries with a population of more than 1 million. Sterilization prevalence is the number of male sterilization users as a percentage of women aged 15–49 who are currently married or living in union. Numbers of users include male partners of women aged 15–49 who are unmarried or not in union, in countries where there is substantial use of sterilization among such couples. Information on vasectomy was obtained from female partners who answered the survey.