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ADDING IT UP

The Benefits of Investing in Sexual and
Reproductive Health Care



EXECUTIVE SUMMARY

Sustained and increased investment in sexual and reproductive health services in developing countries promises tremendous benefits to women, families and societies. In addition to improved health, sexual and reproductive health services contribute to economic growth, societal and gender equity, and democratic governance. To better appreciate the substantial returns on sexual and reproductive health investments, policymakers need both a fuller accounting of these broad benefits than has been available to date and more complete information about costs.

Sexual and reproductive health services encompass three main areas: contraceptive services, maternal health services and services related to sexually transmitted infections (STIs), including HIV/AIDS, and other gynecologic and urologic problems. Their benefits fall into two large categories—medical and nonmedical.

The medical benefits of improved sexual and reproductive health are the most obvious and perhaps the easiest to measure.

- Sexual and reproductive ill health accounts for one-third of the global burden of disease among women of reproductive age and one-fifth of the burden of disease among the population overall.
- HIV/AIDS accounts for 6% of the global burden of disease.
- The need for sexual and reproductive health services, and thus the potential benefit of meeting the need, is greatest among the poorest women, men and children in the world's lowest-income countries.
- Satisfying the unmet need for contraceptive services in developing countries would avert 52 million unintended pregnancies annually, which, in turn, would save more than 1.5 million lives and prevent 505,000 children from losing their mothers.
- The cost of providing contraceptive services to the 201 million women in developing countries with unmet need (those using traditional methods or no method) would be \$3.9 billion per year.

Understanding the full benefits of sexual and reproductive health services requires looking beyond medical outcomes to broader individual, family and societal benefits.

- Improved sexual and reproductive health underpins all of the Millennium Development Goals.
- By keeping young adults healthy and productive, by allowing parents to have smaller families and thus devote greater time and financial resources to each child, and by reducing public expenditures on education, health care and other social services, sexual and reproductive health services contribute to economic growth and equity.
- By enabling young women to delay childbearing until they have achieved education and training goals and preventing stigmatizing medical conditions, sexual and reproductive health services contribute toward improving women's social position and increasing their community and political participation.

Turning back the HIV/AIDS pandemic, helping women balance work and family, and preventing maternal deaths depend on mobilizing new resources for sexual and reproductive health services.

- More than three-quarters of spending on sexual and reproductive health care is currently provided by individuals, governments and nongovernmental organizations in developing countries.
- Donors in developed countries, in particular, have fallen far short of their commitments made at the 1994 International Conference on Population and Development. In 2000, these countries provided \$2.6 billion for sexual and reproductive health services—less than half of what they had pledged for that year.

ADDING IT UP

The Benefits of Investing in Sexual and Reproductive Health Care

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INTRODUCTION

Policymakers routinely project the costs and benefits of possible interventions, to permit comparisons and guide investment choices for their limited resources. Yet costs may be difficult to compare if interventions are priced in different ways, and benefits, especially from health interventions, can be difficult to pin down—they may be social rather than medical or economic, or they may be hard to express in monetary terms. Sexual and reproductive health services have unusually broad social impacts, and policymakers need better tools for assessing these interventions and comparing differences between them.

This report seeks to address that need. It suggests better ways to interpret and use existing studies to evaluate the impact of sexual and reproductive health investments and also argues for broader approaches to assessing the costs and benefits of these investments. The report systematically outlines a wide range of benefits from sexual and reproductive health services, including some that have not yet been quantified or may not be quantifiable. It may be possible to capture these benefits by making better use of existing approaches, and by developing different methodologies.

The report is intended to help decision-makers and resource allocators at all levels—local and national governments, bilateral and multilateral donors, and nongovernmental organizations—to take the broader contributions of sexual and reproductive health interventions into account when prioritizing health and development investments.

The report examines costs and benefits in the three major areas of sexual and reproductive health interventions:

- contraceptive services, which enable couples to prevent unintended pregnancy and thus control whether and when to have children;
- maternal health services, including prenatal care, obstetric services, postpartum care and abortion-related services;* and
- prevention, diagnosis and treatment of sexually transmitted infections (STIs), including HIV/AIDS, and other gynecologic and urologic health care.

Within this broad look at sexual and reproductive health interventions, the report focuses particularly close attention on contraceptive services, using available data to illustrate a comprehensive and flexible approach to evaluating investment in these services, and a variety of ways to measure outcomes.

Sexual and reproductive health interventions promise both medical and nonmedical benefits

Individuals value good health for itself. Policymakers also see it as essential to achieving broader development objectives, such as higher levels of education, social equity, economic growth and productivity.

*Abortion-related services include management of complications of unsafe abortion, postabortion family planning counseling and (where consistent with national law) safe abortion.

Investments in health care services, including those related to sexual and reproductive health, can make valuable contributions to wider development goals.

Health care services on their own do not ensure a healthy population. On the most basic level, people need adequate food, water and shelter to stay healthy. On the policy level, legal systems must recognize individuals' right to health care, regardless of gender, age or income. In practice, this means that services must be available, and people who need them must be able to get them. There are also less tangible requirements: Social norms must discourage discrimination in health care and encourage healthy behaviors, including the use of health services when needed.

However, even without these broader changes, investments in health care services, including those related to sexual and reproductive health, can make valuable contributions to wider development goals. For example, family planning allows women to achieve higher levels of education and a better balance between family and work. Prenatal care and obstetric care protect the health of both mothers and children and strengthen the family. Education about STIs, including HIV/AIDS, helps promote a healthy workforce and reduces the stress that these infections impose on communities.

It is particularly important when evaluating contraceptive services to assess their nonmedical as well as their medical benefits, because the condition contraceptives are intended to prevent—pregnancy—is not a disease, and bearing children is not an illness. Ideally, and often, childbearing is a healthy, planned reproductive act voluntarily undertaken by a woman and her partner in their desire to build a family. Nevertheless, contraceptive use does confer

health benefits: It protects women and infants from the medical risks of pregnancy, delivery and the postpartum period—in particular, those associated with unplanned pregnancies, closely spaced pregnancies or pregnancies among women who are very young.

In addition, contraception can avert significant economic, social and psychological costs, especially those arising from a mistimed or unwanted pregnancy. Such nonmedical costs can limit life options for women and undermine the well-being of families. They can also hold back social and economic development, and hinder efforts toward gender equality and poverty reduction.

This report builds on an extensive body of work

In the early 1990s, the World Bank, the World Health Organization and others set out to assess the societal burden of disease and ill health, and the cost of prevention and treatment. This rich body of work establishes the value of health—including sexual and reproductive health—interventions. However, nearly all of these studies take a strictly medical perspective, measuring effectiveness only in terms of improved health. They ignore or underestimate social and economic factors that may contribute to disease or inhibit use of health care, and overlook the social and economic impact of improvements in health.

Several obstacles complicate comprehensive analyses of costs and benefits.¹ First, it may be impossible to predict all benefits. Averting an unwanted birth, for example, may have a variety of social, eco-

MILLENNIUM DEVELOPMENT GOALS

In the September 2000 Millennium Declaration, world leaders agreed to a broad agenda aimed at reducing poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women. By 2002, this agenda had been refined into eight concrete goals, each paired with a set of measurable targets. Improved sexual and reproductive health directly underpins goals 3–8 and indirectly affects the achievement of goals 1 and 2.¹

1. “Eradicate extreme poverty and hunger”

Smaller families and wider birth intervals as the result of contraceptive use allow families to invest more in each child’s nutrition and health, and can reduce poverty and hunger for all members of a household. At the national level, fertility reduction may enable accelerated social and economic development.

2. “Achieve universal primary education”

Families with fewer children, and children spaced further apart, can afford to invest more in each child’s education. This has a special benefit for girls, whose education may have lower priority than that of boys in the family. In addition, girls who have access to contraceptives are less likely than those who do not to become pregnant and drop out of school.

3. “Promote gender equality and empower women”

Controlling whether and when to have children is a critical aspect of women’s empowerment. Women who can plan the timing and number of their births also have greater opportunities for work, education and social participation outside the home.

4. “Reduce child mortality”

Prenatal care and the ability to avoid high-risk births (e.g., those to very young women and those spaced closely together) help prevent infant and child deaths. Children in large families are likely to have reduced health care, and unwanted children are more likely to die than wanted ones.

5. “Improve maternal health”

Preventing unplanned and high-risk pregnancies and providing care in pregnancy, childbirth and the postpartum period save women’s lives.

6. “Combat HIV/AIDS, malaria and other diseases”

Sexual and reproductive health care includes preventing and treating sexually transmitted infections, including HIV/AIDS. In addition, reproductive health care can bring patients into the health care system, encouraging diagnosis and treatment of other diseases and conditions.

7. “Ensure environmental sustainability”

Providing sexual and reproductive health services, and avoiding unwanted births, may help stabilize rural areas, slow urban migration and balance natural resource use with the needs of the population.

8. “Develop a global partnership for development”

Affordable prices for drugs to treat HIV/AIDS and a secure supply of contraceptives would greatly advance reproductive health programs, and are especially needed in the least-developed countries.

economic and health effects at the personal, household and societal levels. This report will outline the broad personal, family and societal benefits that sexual and reproductive health services can bring.

Second, certain benefits do not translate well into monetary terms. It is hard to place a monetary value on health, and quantifying the nonmedical benefits of health interventions can be even more challenging. This report will suggest, and where possible illustrate, ways to quantify a range of positive outcomes, using measures that may include dollars and physical units (years of life saved or disability averted, for example), but also less easily quantifiable outcomes, such as increased productivity, greater satisfaction with life, higher levels of community participation or improvements in gender and class equity.

Third, it can be difficult to capture the spillover benefits that investment in one area may have in other areas. For example, health care providers in many countries offer women Pap smears during family planning visits. The tests may result in the early detection and treatment of cervical cancer or precancerous lesions, yet analyses rarely measure reductions in cervical cancer as a benefit of investment in contraceptive services. Similarly, solving a particular social problem may require investment in several areas, yet analyses often attribute the solution to just one. The spillover benefits of sexual and reproductive health services, some of which are highlighted in this report, suggest that some services may often be most effectively provided as an integrated package.

The direct costs of an intervention are usually more predictable, shorter-term and easier to measure than its benefits. However, when weighing one potential intervention against another, it is important to measure costs in the same way. Existing estimates of the costs of different sexual and reproductive health interventions show wide variations in the scope of what is measured and the ways costs are estimated, making comparisons difficult.² Indirect costs and opportunity costs are also difficult to quantify, and analysts have paid little attention to them. This report will highlight some key questions to consider when evaluating cost estimates.

Sexual and reproductive health services are essential to achieving development goals

The Programme of Action adopted at the 1994 International Conference on Population and Development (ICPD) recognizes that sexual and reproductive health is essential to human well-being. A special session of the United Nations General Assembly in 1999 reaffirmed and elaborated the ICPD Consensus.

In 2002, the countries of the United Nations agreed to a broad set of targets—the Millennium Development Goals—that will set international development priorities for years to come. Although they are not explicitly included as a goal in themselves, improvements in sexual and reproductive health will be vital to achieving all of these goals (see box).

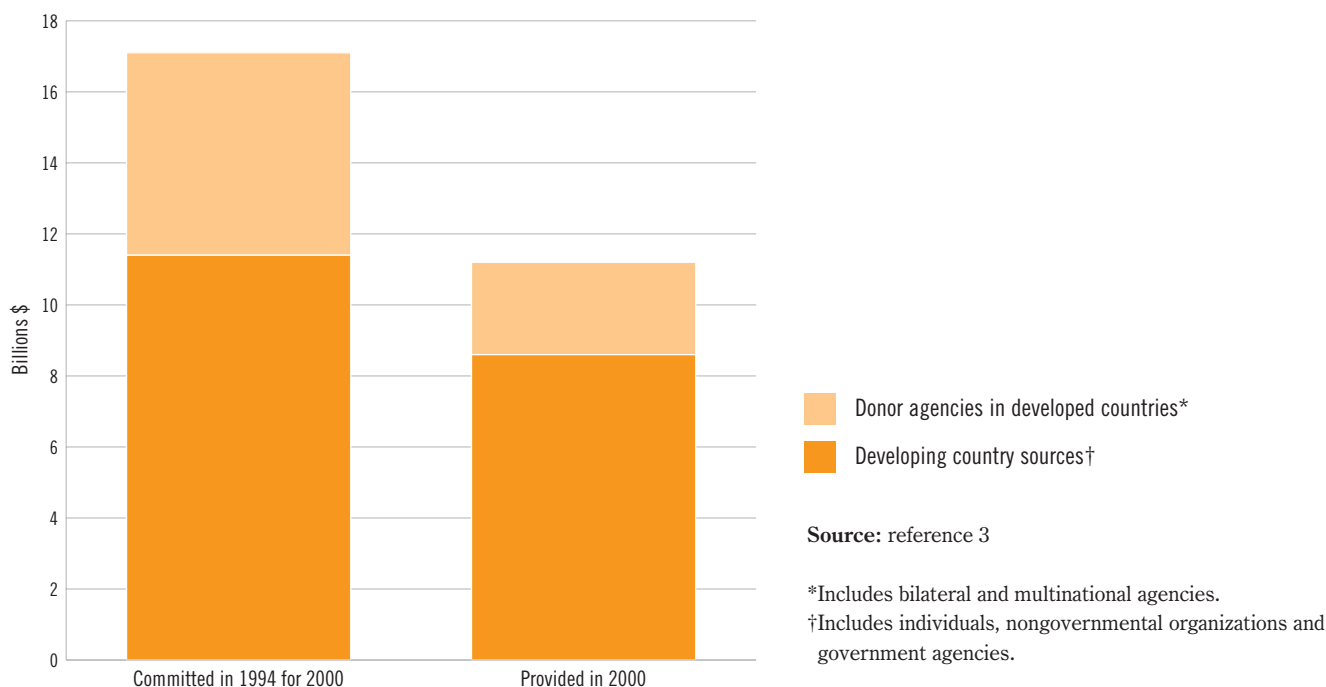


FIGURE 1.1 Support for sexual and reproductive health services falls far short of global commitments.

There is some concern that the absence of specific sexual and reproductive health goals in the Millennium Development Goals will limit resources for comprehensive sexual and reproductive health programs. This concern stems partly from the international community's failure to meet commitments made at the 1994 ICPD for global expenditures in this area. In 2000, investments in this area by developing countries themselves and by donors in developed countries (through bilateral and multilateral assistance) fell far short of what had been pledged for that year (Figure 1.1).³ By quantifying some of the benefits of sexual and reproductive health investments, and offering a broad overview of others, this report underscores the significance of these investments toward achieving the Millennium Goals and other crucial development objectives.

Guide to the report

This report, intended for the general reader, draws on a more detailed technical document.⁴ Chapter 2 reviews and evaluates current approaches to measuring the costs and benefits of investment in health services, and discusses some of their limitations. Chapter 3 provides the most comprehensive accounting to date of the costs and benefits of contraceptive services. These quantitative estimates combine a range of measures and units, including maternal deaths, infant deaths and disability averted; unintended births and abortions averted; and numbers of children who would otherwise grow up without their mothers.

Chapter 4 outlines the broad set of benefits and costs that should ideally be measured in each of the three main areas of sexual and reproductive health. This discussion demonstrates the importance of meeting sexual and reproductive health needs for the quality of life and prospects of poor countries, and for the poorest segments of society in all countries. Chapter 5 reviews the fundamental role of sexual and reproductive health in achieving the Millennium Development Goals and other development objectives, and concludes that increased investment in sexual and reproductive health services is needed.

EXISTING APPROACHES TO MEASURING COSTS AND BENEFITS

Several important studies during the 1990s made substantial progress toward quantifying the medical impact of various diseases and conditions, and the medical benefits of investing in different interventions to prevent or treat them. They also took some steps toward measuring the social and economic costs of ill health and the benefits of prevention.

Key findings from these studies, particularly as they relate to sexual and reproductive health interventions, as well as some of the shortcomings of these analyses, are discussed below.

Various approaches have been used to measure the impact of health interventions

The Global Burden of Disease initiative, a joint effort of the World Health Organization (WHO), the World Bank and the Harvard School of Public Health, pioneered estimation of the worldwide health impact of all major diseases and conditions, including those related to reproduction and sexual behavior. For 1990 and again for 2001, the project quantified the impact of more than 100 diseases and conditions in terms of *medical costs*, calculated as years of life lost to disability and death.¹ In a complementary effort, the World Bank's Disease Control Priorities for Developing Countries project estimated the cost-effectiveness of various interventions to prevent or treat specific diseases and conditions; the findings were published in 1993² and updates are currently in progress.

The World Bank's *World Development Report 1993: Investing in*

Health combined the two approaches, recommending a package of cost-effective interventions to improve the quality of public spending.³ This prioritized package included interventions to improve sexual and reproductive health.

Other efforts focused on the *economic benefits* of health interventions. Several country-specific studies measured the savings on social services that would be achieved if families had fewer children. The Commission on Macroeconomics and Health took a broader view. Working with experts from Harvard University, WHO, the World Bank and elsewhere, the commission in a 2001 report estimated the economic impact of improved health in terms of greater productivity and national income growth.⁴

Focusing on contraceptive services only, Family Health International's (FHI's) Women's Studies Project in the mid- to late 1990s documented a broader range of outcomes, such as improved employment opportunities for women, better partner relationships and a greater sense of well-being. It also documented drawbacks, such as the side effects of contraceptive methods and family disapproval of contraceptive use.⁵

Looking at the *economic costs* of interventions in the areas of sexual and reproductive health, the Programme of Action of the 1994 International Conference on Population and Development (ICPD) estimated the resources required to reach its goals.⁶ The United Nations Population Fund (UNFPA) compiled data on the country-

Sexual and reproductive health problems account for 18% of the total global burden of disease and 32% of the burden among women of reproductive age.

specific and average costs of a range of sexual and reproductive health interventions.⁷ In addition, the Joint United Nations Programme on HIV/AIDS (UNAIDS) has prepared cost estimates for 25 key HIV/AIDS interventions.⁸

The medical benefits of sexual and reproductive health interventions are substantial

The medical benefits of health interventions are often expressed in disability-adjusted life years, or DALYs, a measure developed by the Global Burden of Disease project and widely used to evaluate potential health interventions (see box, page 10). According to WHO's 2001 estimates, sexual and reproductive health problems account for 18% of the total global burden of disease and 32% of the burden among women of reproductive age (15–44) worldwide^{9*}:

- Maternal conditions (hemorrhage or sepsis resulting from child-birth, obstructed labor, pregnancy-related hypertensive disorders and unsafe abortion) account for 2% of all DALYs lost (13% of all DALYs lost among reproductive-aged women).
- Perinatal conditions (low birth weight, birth asphyxia and birth trauma) account for 7% of all DALYs lost.
- HIV/AIDS accounts for 6% (14% among women aged 15–44).

*Revisions to estimates of DALYs are in progress. Preliminary results show a small decline in DALYs due to HIV/AIDS, overall and among reproductive-aged women.

†These include STIs other than HIV/AIDS, iron-deficiency anemia among women aged 15–44, breast cancer, ovarian, cervical and uterine cancer, and genitourinary diseases, excluding nephritis and nephrosis.

- Other sexual and reproductive health conditions account for 3% (5% among reproductive-aged women).[†]

By comparison, respiratory illnesses account for 11% of all DALYs lost, cardiovascular diseases for 10% and neuropsychiatric conditions (e.g., depressive disorders, alcohol and drug abuse, schizophrenia, bipolar disorder and dementias) for 13% (Table 2.1, page 11).¹⁰

While the Global Burden of Disease project focused on the potential benefits (in terms of DALYs saved) of eliminating various diseases and conditions, the World Bank's Disease Control Priorities for Developing Countries project assessed the costs and benefits of specific prevention and treatment interventions. For example, the 1993 *Disease Control Priorities* report examined the cost-effectiveness of family planning services and improved obstetric care.¹¹ Using hypothetical models, it measured the cost of various interventions against the numbers of deaths of mothers and infants, and other adverse events—including unwanted births, maternal and infant ill health, and low birth weight—each would avert.

The report found that an increase in contraceptive use from zero to 20%, as the result of providing family planning services in a high-mortality, high-fertility setting (for example, Sub-Saharan Africa) was highly cost-effective in preventing a range of adverse events. The cost of averting maternal deaths, perinatal deaths, maternal morbidity and low birth weight was approximately \$140 per event

DISABILITY-ADJUSTED LIFE YEARS (DALYS)

The DALY is a tool for measuring medical impact. DALYs lost to a disease, injury or health condition represent the sum of two components:

- the cumulative number of years lost as a result of premature death (This is determined by subtracting actual years lived from the assumed standard life expectancy of 82.5 years for women and 80.0 years for men.); and
- the cumulative number of healthy years of life lost to disability (To calculate this indicator, each disability is assigned a severity weight between 0 (perfect health) and 1 (equivalent to death). Infertility, for example, has a weight of 0.18, meaning that 0.18 of a DALY is subtracted for each year that a person lives with infertility. The disability weight considers only functional disability, not social, cultural or economic factors.)

DALYs are further adjusted for age and the stage of life in which a disease or disability emerges. The calculation weights healthy life years lost by young adults more heavily than those lost by children or the elderly, and disabilities that occur immediately or in the short term more heavily than those occurring many years later.

(averaged across all of these events, and in 1993 dollars*).¹² In addition to saving lives and preventing illness and disability, this spending had such medical benefits as allowing mothers more time to breastfeed between births and reducing their risk of anemia.

The 1993 *Disease Control Priorities* report also compared different approaches to reducing sexually transmitted infections (STIs), in terms of dollars per DALY saved. As might be expected, programs aimed at high-risk groups were found to be much more cost-effective than those aimed at the general population. For example, educational programs intended to increase condom use among high-risk groups cost only a few pennies per DALY saved, while similar programs targeting the population at large cost several dollars per DALY saved, because the risk of contracting or spreading STIs is, on average, much lower among the general population.¹³

The World Bank's 1993 *World Development Report* focused on health interventions, and presented a set of services—the “essential health package”—that would make the most efficient use of scarce health resources. Family planning, maternal health care, and prevention and treatment of STIs, including HIV/AIDS, were all included in the package for low-income and middle-income countries because they were highly cost-effective.¹⁴

*Many dollar values quoted in this report are 1993 dollars. To put these values in perspective, note that the cumulative inflation rate in the United States from 1993 to 2002 was 24.5%. Source: U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index 1913–2003, Sept. 16, 2003, <<http://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt>>, accessed Oct. 13, 2003.

The report provided a range of costs, depending on the setting. It estimated that family planning services would cost \$15–150 for each DALY saved; prenatal and delivery care \$30–250 per DALY saved; STI/HIV prevention \$1–250 per DALY saved; and prevention of breast and cervical cancer, \$50–100 for each DALY saved. By comparison, the cost per DALY saved on other health interventions ranged from \$5–20 for preventing deficiencies in iron, vitamin A or iodine, to \$5–250 for prevention of malaria, to \$1,600–3,500 for environmental control of dengue. These cost ranges were drawn from the *Disease Control Priorities* report, which also provided average costs for a wider range of preventive and treatment interventions (Figure 2.1, page 12).¹⁵

Treatment generally costs much more than prevention—for example, prevention of cervical cancer costs \$100 per DALY saved, but treatment costs \$2,500 per DALY saved. Preventing cardiovascular conditions costs \$150 per DALY saved, treatment \$2,000–30,000.¹⁶ While both prevention and treatment are necessary, in Sub-Saharan Africa, interventions to prevent HIV are at least 28 times more cost-effective than antiretroviral therapy.¹⁷

Another study measured the benefits of an increase in family planning assistance from the U.S. Agency for International Development in terms of lives saved. The study estimated that a \$169 million increase in family planning funding in 2001 would save the lives of 15,000 women (8,000 who would have died as a result of unsafe

Health problem	% of disability-adjusted life years (DALYs) lost, 2001	
	Total population	Women 15–44
Sexual and reproductive health conditions	17.8	31.8
Respiratory conditions	10.7	4.1
Cardiovascular conditions	9.8	4.3
Neuropsychiatric conditions	13.0	25.4
Injuries	12.2	12.4
Other communicable conditions	19.6	8.8
Other noncommunicable conditions	16.8	13.2
Total	100.0	100.0

Source: reference 10.

Note: Totals may not add to 100.0 because of rounding.

TABLE 2.1 Much of the global burden of disease is due to sexual and reproductive ill health.

abortion and 7,000 who would have died from other pregnancy-related causes) as well as the lives of 92,000 infants.¹⁸

Health interventions, including family planning, have economic benefits as well

In addition to medical benefits, the 1993 *Disease Control Priorities* report measured some of the economic benefits of contraceptive services in hypothetical but typical settings, estimating subsequent savings on government-funded primary and secondary education and health services if unintended births were averted.

In a typical high-mortality, high-fertility African country, the cost of averting a single unintended birth through family planning was \$368; the estimated savings to the government was \$440. Costs are high in this case because family planning programs in this region are typically in their start-up phase, with high initial infrastructure costs and few users.

Cost per user falls as family planning programs become established and attract more clients, as in Latin America, where governments generally spend more on education and health services per capita than they do in Africa. The cost to avert an unwanted birth in a typical low-fertility Latin American country was estimated at \$133, and savings at \$1,600—meaning that each dollar spent on family planning saved the government \$12 in health and education costs alone.¹⁹

Other analyses demonstrate actual benefits of investment in family

planning and related services. Even though some of these studies are at least a decade old, they provide some of the best available examples. Again, only a few benefits are measured—usually confined to health and education—and the estimates span a wide range because of a variety of factors, including the number of services covered, the efficiency of government expenditure and the methodology employed.

A study in Mexico found that for every peso the Mexican social security system spent on family planning services between 1972 and 1984, it saved nine pesos in expenses for treating complications of unsafe abortion and providing maternal and infant care.²⁰ Similarly, every dollar invested in Thailand’s family planning program saved the government more than \$16.²¹ Even more dramatic, an analysis in Egypt found that every dollar invested in family planning saved the government \$31.²² This projection included government expenditures on education, food, health, housing, and water and sewage services.

A study in Vietnam found that over time every dollar invested in family planning would save about \$8 in health, education and other social services.²³ The analysis, based partly on actual experience and partly on projections, covered a 31-year period from 1979–2010. Benefits began to outweigh costs in 1995. The bulk—90%—of the estimated savings from family planning were in the educational sector; the rest were from lower expenditures on maternal and child health care, social services and social security.

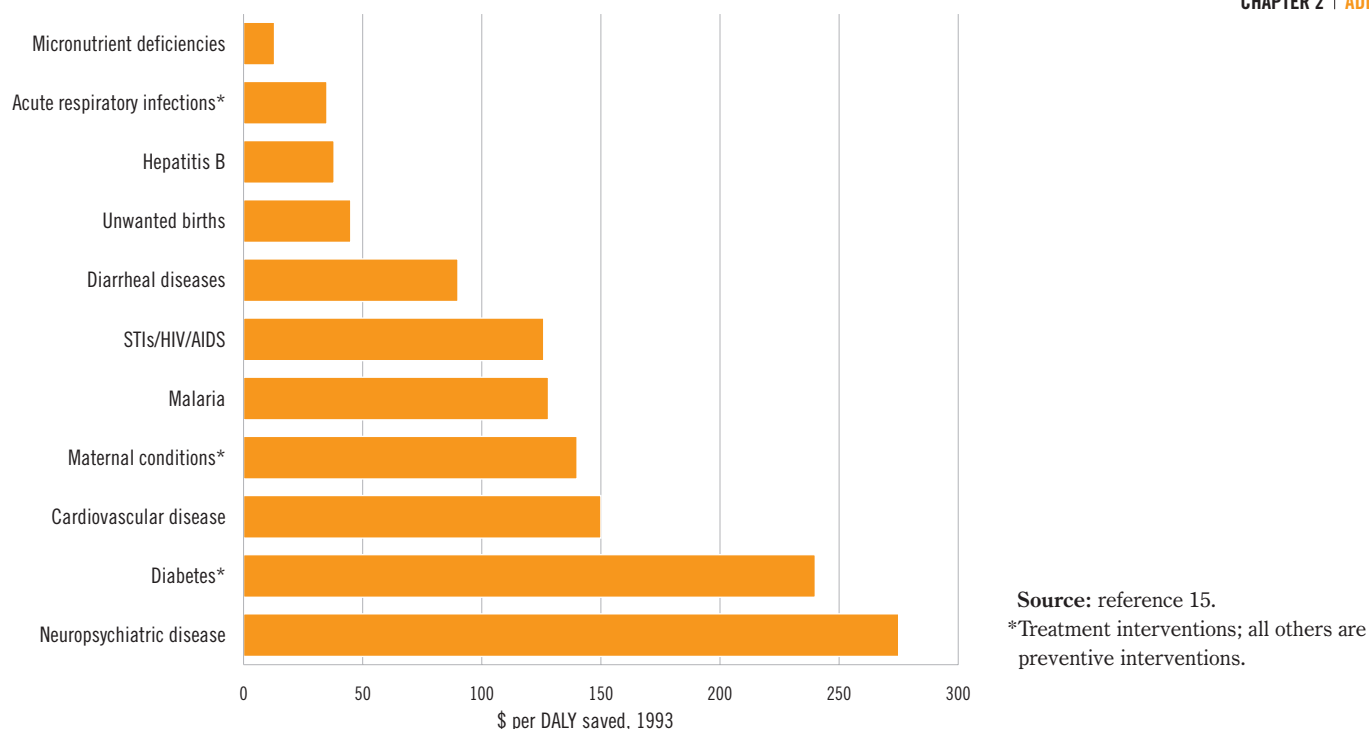


FIGURE 2.1 The cost-effectiveness of health interventions varies widely.

Moving beyond the benefits of reducing government spending, the 2001 report of the Commission on Macroeconomics and Health argued for increased investment in health to achieve broader economic gains.²⁴ The commission assessed the direct impact of the loss of DALYs on national income, in terms of lower productivity and reduced gross national product. But it took the argument further: Where mortality is high, parents are likely to have more children but to invest less in each child's health and education, impeding economic prospects. Finally, the commission argued that chronic disease and low productivity discourage foreign direct investment in business and infrastructure. It concluded that increased spending on priority health interventions would alleviate all three of these problems and bring substantial macroeconomic benefits.

The commission's health agenda largely mirrored the World Bank's essential health package but placed greater emphasis on prevention of malaria, improvements in nutrition and treatment for HIV/AIDS. The commission included maternal and perinatal conditions among its eight priority intervention areas, but its package of essential services, unlike the World Bank's, did not include contraceptive services. Nor did it specifically address STIs, other than HIV. Nevertheless, the commission's report clearly considered family planning important: "One of the most important health interventions is greater attention to reproductive health, not only to control STIs such as HIV, but also to limit fertility through family planning, including access to contraception."²⁵

The commission's framework, in fact, rests upon the assumption that as health conditions improve and mortality rates fall, households will choose to limit childbearing in order to invest greater resources in each child. For this to be possible, contraceptive services must be available.

Some social benefits of sexual and reproductive health interventions have also been documented

In its assessment of the benefits of contraceptive use to women, FHI's Women's Studies Project documented specific improvements in women's empowerment and quality of life.²⁶ For example, Bolivian women using modern contraceptives were more likely to have paid jobs; so were Indonesian women using long-acting methods. The project also investigated some of the costs to women of using contraceptives. These included side effects (both real and suspected) and fear of husbands and other relatives who opposed use of contraceptives.²⁷

A large literature has assessed the relative contributions of family planning programs and socioeconomic development to fertility decline. These cross-national, aggregate studies show that the relationships are complex, but that social and economic development and family planning service provision work together, and that both have independent effects in reducing fertility levels.²⁸ A particularly persuasive example is the Matlab experiment in Bangladesh, where intensive, high-quality services in a pilot program increased contraceptive use and lowered fertility, even though the level of

development was very low.²⁹ One analysis has shown that family planning programs were responsible for 43% of the decline in fertility between 1960–65 and 1980–85.³⁰ While some studies have challenged these findings,³¹ the current consensus is that family planning programs are an “effective public policy for increasing contraceptive use and lowering fertility.”³²

Other studies have measured the costs of sexual and reproductive health interventions

Several analyses focus exclusively on estimating the financial costs of providing sexual and reproductive health services. The scope of these studies ranges widely. Some are at the global level and aim to inform donor countries of overall needs. Others are local in scope and are intended to assist program managers in planning service provision.

UNFPA and other experts have estimated the costs of providing universal sexual and reproductive health care, as input to the ICPD Programme of Action. The estimates comprise four components: family planning services; other reproductive health services; HIV/AIDS prevention; and basic research in population issues.

For the year 2000, the estimated worldwide cost of providing family planning services was \$10.2 billion (in 1993 dollars). Sixty-five percent of this cost (\$6.6 billion) was for maintenance and improvements in the service delivery infrastructure, which would benefit all components of sexual and reproductive health care. In addition, the

cost of other reproductive health programs undertaken as part of primary care was estimated to be \$5.0 billion in 2000. And, HIV/AIDS prevention, consisting of mass media, school education and condom distribution efforts, cost an estimated \$1.3 billion.³³

More recently, UNFPA reviewed and synthesized cost information on sexual and reproductive health services into a database, drawing from more than 500 published and unpublished studies.³⁴ Available information varies widely by region and type of service. Studies also vary in whether they measure all of the main subcategories of costs—drugs and supplies, labor, overhead and capital investment—and in their approaches to measuring costs. Nevertheless, the review provides rich information on the costs of family planning, maternal health care, and prevention and treatment of STIs.

Costs vary widely according to a country’s level of development, but the information in the various studies can be standardized by summing the costs provided for each of the main components of a visit to a provider. Estimates of the cost (in 2001 dollars) for a woman’s first visit to obtain oral contraceptives average about \$8.00: \$1.00 for drugs and supplies, \$0.50 for labor, \$6.50 for overhead (including capital). Delivery costs for an uncomplicated vaginal birth average about \$28.00: \$5.00 for drugs and supplies, \$6.00 for labor, \$11.00 for overhead (including capital) and \$6.00 for the hospital stay.

UNAIDS estimates of the costs of 25 key interventions required to meet international goals for reducing HIV/AIDS cover 135 low- and

middle-income countries for the period 2001–2007. These estimates take into account the “maximum feasible coverage,” given existing physical infrastructure and human resources. The estimated global total cost for prevention and treatment rises from \$3.2 billion in 2001 to \$10.5 billion in 2005 to \$15 billion in 2007. The largest share (around 50% of the total) is for AIDS care and treatment, followed by HIV/AIDS prevention (about 44% of the total). A much smaller share (about 3% in 2001 and 6%, or \$900 million, in 2007) would provide care for children orphaned by AIDS.³⁵

Existing studies underestimate the benefits of sexual and reproductive health services

Research has made good progress toward establishing a rational basis for allocating resources to specific interventions. The major studies treat sexual and reproductive health as a key part of overall health, and generally find sexual and reproductive health interventions to be highly cost-effective. However, most of these analyses quantify only the *medical* benefits of health interventions. They tend to underestimate, or omit, economic, social and psychological benefits, which are of particular importance in sexual and reproductive health.

More importantly, the units used by the Global Burden of Disease and other approaches to measure benefits—DALYs saved—are not broad enough to measure the full range of medical, economic, social

*Regional weights are being developed by WHO, but are not yet completed; as a result, the estimates available for use in this report do not have region-specific weights.

and psychological benefits of sexual and reproductive health services. A conceptually different approach is needed. Indeed, the value of sexual and reproductive health cannot always be expressed in terms of quantifiable outcomes: How should we quantify, for example, the value of the ability to have a child? Other benefits—such as gains in education that children in smaller families enjoy and the increases in productivity that follow—may be measurable, but in practice have rarely been measured because of the need for in-depth and longitudinal data.

In addition, DALYs may define the benefits of medical interventions too narrowly. To estimate the DALYs lost to each disease or condition, a panel of experts determined the severity of subsequent *functional* disability uniformly for the world as a whole. However, the experts’ weighting may differ from how people in different countries and contexts experience such outcomes because of the importance of cultural, economic and quality-of-life factors.* In some societies, for example, the prevention of infertility or obstetric fistula would have social benefits that might even exceed their physical or medical benefits. If these benefits are not taken into account, a potential intervention will be undervalued.

Even when expressing strictly medical benefits, DALYs may undervalue sexual and reproductive health interventions. For example, the Global Burden of Disease estimates always assign death or disability to just one cause. Yet many health problems result from multiple interacting causes; for example, pregnancy may bring on or

Sexuality and reproduction are...fundamental to personal identity and fulfillment, and to family and social relationships. Sexual and reproductive health services help individuals and societies achieve a range of social and economic goals.

aggravate some complications of diabetes. So the estimates should assign some of the DALYs lost to diabetes and some to pregnancy. Capturing such effects would make DALYs more useful in assessing cost-effectiveness and designing appropriate interventions.

Similarly, a particular health intervention may have benefits for aspects of health beyond its principal focus area. When these spillover benefits are not taken into account, that intervention is not credited with the full benefits that it has generated. For example, condoms provided as part of an STI prevention program may also prevent unintended pregnancies. This indirect benefit may not be attributed to the provision of STI services.

The Commission on Macroeconomics and Health looked beyond strictly medical benefits, but it took into account neither the economic effects of improved health for individuals, households and communities nor the social and personal benefits. By addressing some of these broader outcomes, FHI's Women's Studies Project made a strong start in determining the impact of contraceptive services on women's lives. Much more work is needed on the personal, household and societal benefits of contraceptive services, and on the impacts of the other two main aspects of sexual and reproductive interventions: maternal health care, and STI-related services and other gynecologic and urologic care.

As with benefits, measurement of costs in existing studies varies widely in terms of what aspects are included, making it difficult to

compare results across studies.³⁶ Costs calculated for services often include only direct costs such as labor and materials used, omitting overhead and investment costs. Another important cost that is rarely addressed adequately is the opportunity cost for potential clients. For a low-income woman in a developing country, a trip to the health clinic may be extremely costly in terms of the value of forgone time and cultural pressures. Delaying childbearing, being HIV-positive or using a condom may leave women, and men, vulnerable to social stigma.

Finally, while a number of approaches measure only the costs of health care interventions and others measure only the benefits, relatively few attempt to assess the overall cost-effectiveness of a program by measuring and analyzing both.

Existing analyses have focused attention on medical and, to a lesser extent, macroeconomic benefits of investing in health. This approach is extremely effective in providing evidence to support strategies to combat diseases, but it fails to capture the full personal, social and economic benefits of health care, notably those of sexual and reproductive health services. Sexuality and reproduction are not simply about health; nor are they simply a factor influencing macroeconomic growth. They are fundamental to personal identity and fulfillment, and to family and social relationships. Sexual and reproductive health services help individuals and societies achieve a range of social and economic goals.

RETURNS ON INVESTMENT IN CONTRACEPTIVE SERVICES

Despite their limitations, existing methods for measuring costs and benefits serve as a good starting point for demonstrating the value of investments in sexual and reproductive health programs to policymakers and others who allocate resources. To illustrate, this chapter uses available data to estimate the costs and health-related benefits of providing contraceptive services to all women in developing countries who need them.

The focus here is on developing countries because as the preference for small families increases and as populations continue to grow, the unmet need for contraceptive services in these countries remains large and, in some cases, is increasing. Developing countries cannot meet this need on their own, and even with assistance from donor countries and international agencies, they are hard-pressed to provide necessary contraceptive services, as well as other sexual and reproductive health care and primary health care in general.

Contraceptive provision is often undervalued in benefit assessments because unintended pregnancy, the outcome contraceptive use prevents, is not a disease, and health-based measurements do

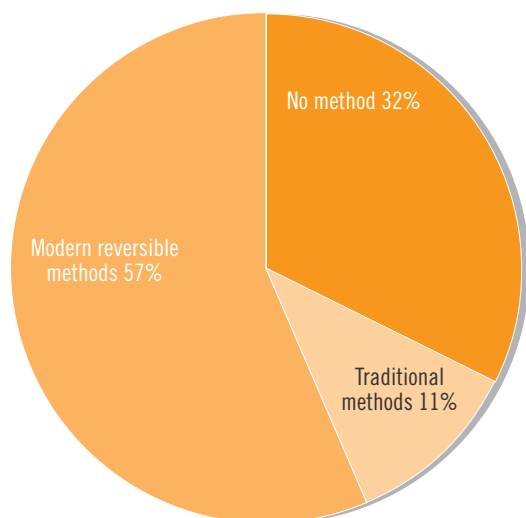
*Countries are grouped according to the United Nations classification by region and according to the World Bank's classification by income (low, lower-middle, upper-middle and high). Source: United Nations, Classification of countries, developing countries in the regional aggregates, <http://www.undp.org/hdr2003/pdf/hdr03_backmatter_2.pdf>, accessed Oct. 16, 2003; and, World Bank, Country classification, classification of economies, <<http://www.worldbank.org/data/countryclass/countryclass.html>>, accessed Oct. 16, 2003.

not capture the considerable social and economic benefits attainable through increasing couples' ability to control the timing and number of children they have. Indeed, we still lack adequate ways of measuring some of these benefits. Even so, health-related outcomes are real and measurable—contraceptive use averts infant and maternal deaths and pregnancy-related ill health, for example—and estimating their costs and benefits can help policymakers in both donor and developing countries appreciate the value of providing such services.

This chapter measures unplanned pregnancies (unwanted and mistimed births and abortions) prevented by contraceptive use. It also shows benefits in disability-adjusted life years, or DALYs. (See appendix, page 34, for information on the data sources and methods used to produce these estimates.) It considers variations within the developing world, across regions and across categories of countries according to income level,* as these variations relate to the size of the need for external assistance and support.

The estimates here include costs and benefits for all women at risk of unintended pregnancy, which includes those who are already using a modern contraceptive method, as well as women who have an unmet need for effective contraceptives, i.e., women who are using a traditional method or are not using any method, even though they are sexually active, can become pregnant and do not wish to have a child, ever or in the next two years.

WOMEN AT RISK SEEKING TO SPACE BIRTHS (234 MILLION)



WOMEN AT RISK SEEKING TO LIMIT BIRTHS (471 MILLION)

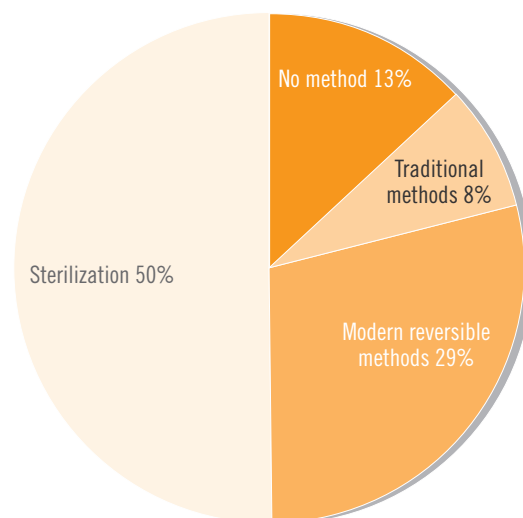


FIGURE 3.1 Women in developing countries seeking to space births are more likely than those who wish to limit births to use no method or use a traditional method.

Source: reference 2. Note: Estimates are for 2003.

More than half of all women in developing countries are at risk of unintended pregnancy

One in four people in developing countries—more than 1.32 billion—are women of reproductive age (15–49).

- Almost half of these women live in low-income countries, where the average per capita annual income is less than \$745.¹
- Twenty-seven percent live in China, 46% in other Asian countries, 15% in Africa, and 11% in Latin America and the Caribbean.
- Roughly two-thirds are married or living with a partner.

More than half of women 15–49 in the developing world—some 705 million—are at risk of unintended pregnancy.

- One-third, or 236 million, of these women, have had a tubal ligation or have a partner who has had a vasectomy.
- Thirty-eight percent, or 268 million, are relying on a reversible method of contraception that requires trained providers and regular, continuous supplies—the IUD (most common), long-acting hormonal methods, oral contraceptives, condoms and vaginal methods.
- Nine percent, or 64 million, are using traditional methods—principally periodic abstinence and withdrawal—which do not require specialized advice or supplies, but which have relatively high failure rates.
- Almost 20 percent, or 137 million, are using no method.
- One-third of all women in developing countries at risk of unintended pregnancy want to have children in the future, but not in

the next two years (234 million), and two-thirds (471 million) want no more children.

- Women seeking to delay or space future births are twice as likely as those who want no more children to use no method or to use a traditional method—43% vs. 21% (Figure 3.1).²
- Because women who want to delay or space future births are much more likely than those who want no more children to use no method or to use a contraceptive other than sterilization, they account for 51% of the 76 million unintended pregnancies that occur annually in developing countries.

The cost of providing modern contraceptive services to current users in the developing world is \$7.1 billion per year (in 2003 dollars). This cost is more comprehensive than some other estimates because it includes labor, overhead and capital, as well as contraceptive supplies (Figure 3.2, page 18).³ Each year, this spending prevents

- 187 million unintended pregnancies,
- 60 million unplanned births,
- 105 million induced abortions,
- 22 million spontaneous abortions,
- 2.7 million infant deaths,
- 215,000 pregnancy-related deaths—79,000 from unsafe abortions and 136,000 not related to induced abortion,
- 685,000 children from losing their mothers as a result of pregnancy-related deaths and

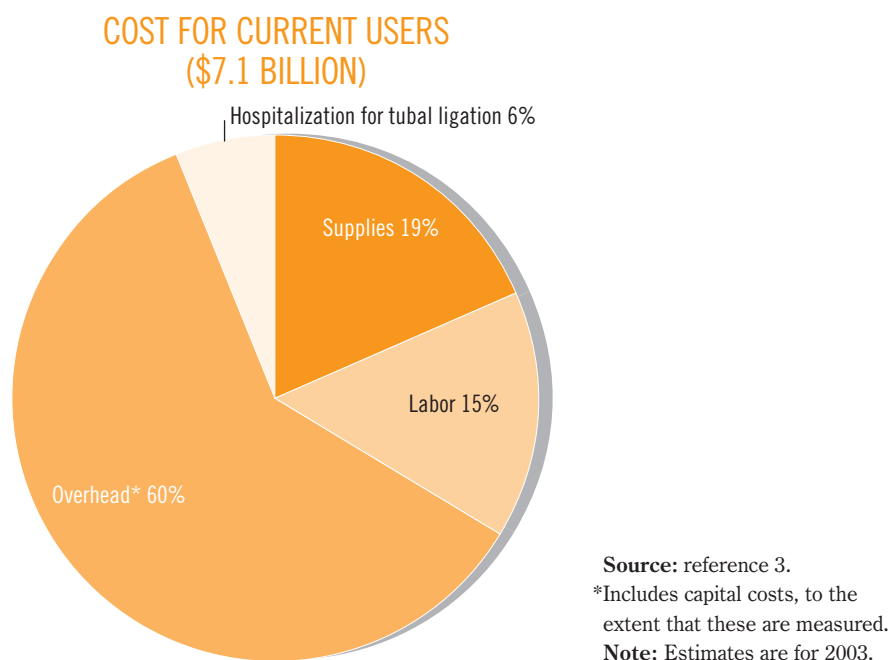


FIGURE 3.2 The cost of contraceptive services in developing countries includes much more than supplies.

- the loss of 60 million DALYs—16 million among women and 44 million among infants and children.

Preventing these health consequences also reduces the need for services such as treatment of the complications of unsafe abortion and care for orphans.

About 200 million women have an “unmet need” for effective contraceptives

The definition of “unmet need” used in this report varies from the definition used by the Demographic and Health Surveys, which includes only women who are using no method at all. Women who are using a traditional method (withdrawal, periodic abstinence or another nonmodern method) are included here because of these methods’ high failure rates and likelihood of discontinuation, given the high levels of knowledge and motivation required for sustained and successful use. Most women who discontinue traditional methods switch to a modern method, according to evidence from several countries.⁴

Some 201 million women in the developing world have an unmet need for effective contraceptives. That is, almost three in 10 women at risk of unintended pregnancy, and about one in seven women of reproductive age, have an unmet need for contraceptive services.

Under the definition of unmet need for contraception used in this report,

- 29% of women in developing countries at risk of unintended pregnancy have an unmet need—63% of women at risk in Sub-Saharan Africa, 29% in Latin America and the Caribbean, and 24% in Asia (Figure 3.3)⁵ and
- three in five women in developing countries with unmet need live in low-income countries.

Women who seek to postpone childbearing or space births, as well as those who want no more children, have unmet need for contraceptives. In fact, more than half of women in developing countries with unmet need—102 million—want to delay or space births for at least two more years.

- Women in low-income countries with unmet need are more likely to want to delay or space births than to limit them, while the reverse is true in all other developing countries.
- Two-thirds of women in Sub-Saharan Africa with unmet need for contraceptive services want to space their next birth, compared with fewer than half of women in Asia and in Latin America and the Caribbean.
- One in 10 women with unmet need have never been married.

Women in developing countries have an estimated 76 million unplanned pregnancies every year.

- Twenty percent of these pregnancies, or 16 million, occur among

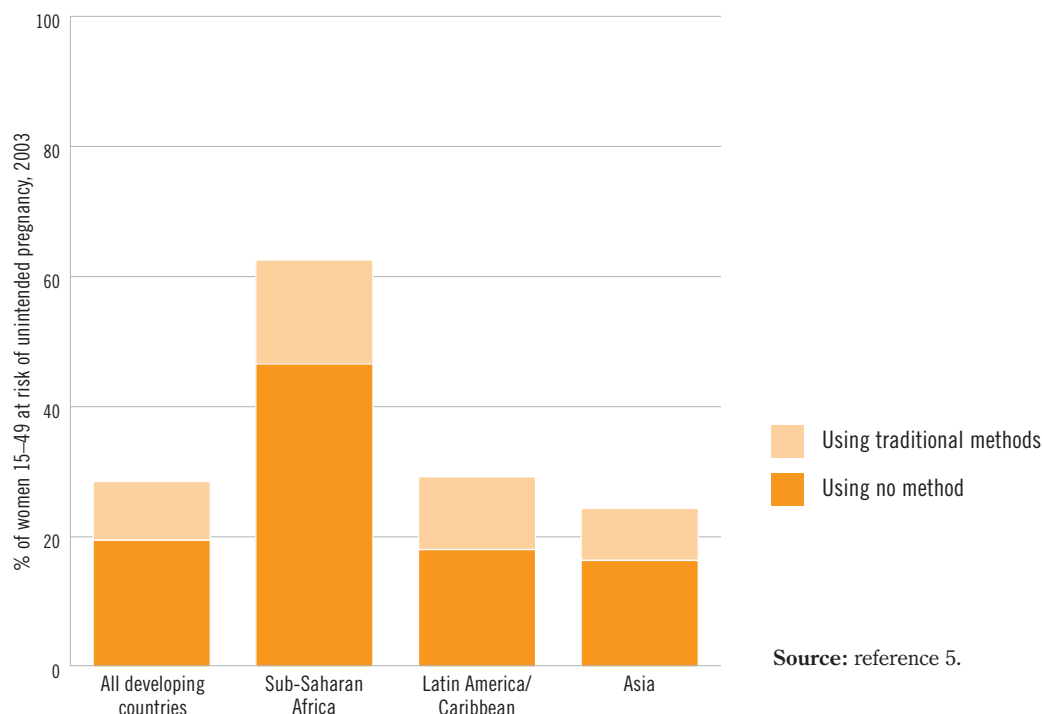


FIGURE 3.3 Unmet need for effective contraceptives is particularly great in Sub-Saharan Africa.

the approximately 504 million women at risk of an unintended pregnancy who are using a modern contraceptive method but become pregnant because of incorrect or inconsistent use or method failure.

- Fourteen percent, or 10 million, occur among the 64 million women relying on traditional methods.
- Sixty-six percent, or 50 million, occur among the 137 million women using no contraceptive method.

Although women with unmet need for modern contraceptives make up three in 10 women at risk of unintended pregnancy, they account for eight in 10 unintended pregnancies (Figure 3.4, page 20).⁶

Some costs and benefits of meeting unmet need can be estimated

If contraceptive services were available, many—but not all—of the 201 million women in developing countries with unmet need would adopt a modern method. Some women will always have problems with modern methods, as a result of side effects, misconceptions, cultural values or personal preference. At the same time, however, some women who are not considered to have an unmet need (usually because they plan to have a child soon) say they intend to use a modern contraceptive method.⁷ The estimates below assume that these two groups will be roughly equal in size, so that the equivalent of 100% of current unmet need would be met if sufficient contraceptive services were provided. If, in reality, a smaller proportion

of women adopted a modern method, then both the costs and the benefits of contraceptive services would be proportionately reduced.

If the 201 million women with unmet need followed patterns of modern method use similar to women in their country or subregion who currently use modern contraceptives,

- about 42 million would choose female sterilization, and the partners of close to three million would choose vasectomy;
- some 66 million would choose IUDs and other long-acting reversible methods;
- about 48 million would choose oral contraceptives; and
- some 43 million would choose condoms (as their primary family planning method).

The added cost of providing these contraceptive services would total \$3.9 billion (in 2003 dollars) per year. These costs include \$696 million for drugs and supplies, \$90 million for hospitalizations for women having tubal ligations, \$413 million in labor costs and \$2.7 billion for overhead and capital expenses.

Even though some unplanned pregnancies would still occur because of contraceptive failures among women using modern methods, meeting unmet need would avert an additional 52 million pregnancies each year—26 million pregnancies would be delayed to a later time, and 26 million pregnancies would be prevented altogether.

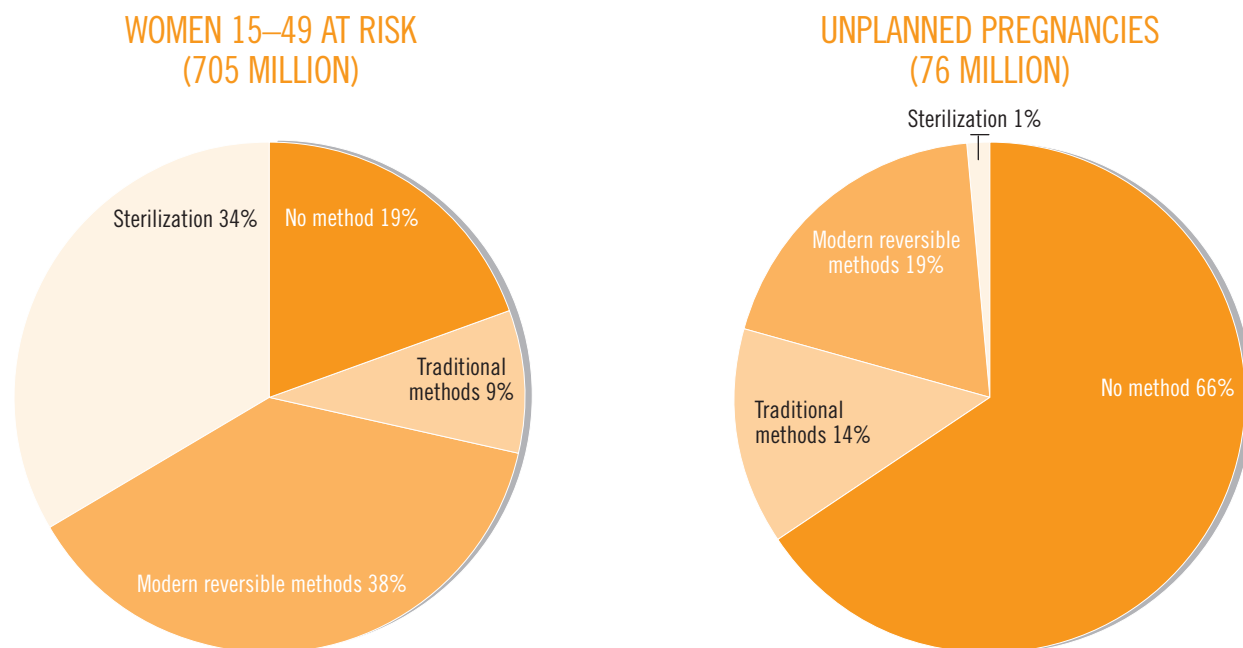


FIGURE 3.4 Only three in 10 women at risk of unintended pregnancy in developing countries use no contraceptives or use traditional methods, but they account for eight in 10 unplanned pregnancies.

Source: reference 6. Note: Estimates are for 2003.

This would reduce the number of unplanned births in developing countries by 72% and the number of induced abortions by 64%.

Averting 52 million unintended pregnancies would prevent

- 23 million unplanned births,
- 22 million induced abortions,
- seven million spontaneous abortions,
- 1.4 million infant deaths,
- 142,000 pregnancy-related deaths—53,000 from unsafe abortions and 89,000 from other causes and
- 505,000 children from losing their mothers.

This investment would also prevent the loss of 27 million DALYs—nine million among women and 18 million among infants and children. In other words, \$144 invested in sexual and reproductive health services in developing countries saves a year of healthy life.

Low-income countries would experience the greatest benefits: 80% of the deaths prevented and 75% of the DALYs saved. If all unmet need were to be met in low-income countries, 47,000 abortion-related deaths and 79,000 maternal deaths from other causes would be averted, and 457,000 more children would have the opportunity to grow up with their mothers (Figure 3.5).⁸ Moreover, within low-income countries, most of the benefit would go to the poorest women and children, because disadvantaged women are more likely than those who are better off to have unmet need.⁹

The case for additional investment is strong

Individual countries and the international community are already meeting a large proportion of the need for contraceptive services in the developing world. They could close the remaining gap by fulfilling the commitments made at the International Conference on Population and Development (ICPD) in 1994, saving hundreds of thousands of lives and millions of DALYs, as well as generating a host of nonmedical benefits.* Women who can avoid unplanned births and hence pregnancy-related disabilities have more opportunities for education, training, employment, and community or political activities. They also have more time and resources to invest in their children. Just as important, the ability to decide freely and responsibly the number, timing and spacing of one's children is a basic human right.¹⁰

The benefits of contraceptive services extend beyond the estimates presented in this chapter. In addition to supplying contraceptives, clinics may provide a wide range of sexual and reproductive health

*The total cost estimated here for meeting the needs of current contraceptive users as well as for meeting all unmet need is \$11 billion (in 2003 dollars). This total differs somewhat from the total estimated as part of the efforts related to the ICPD (\$10.2 billion in 1993 dollars, or \$12.6 billion in 2003 dollars), for a number of reasons: The ICPD estimate included countries with economies in transition, while the estimates presented here do not; the ICPD estimate anticipated higher rates of increase in contraceptive prevalence in some Asian subregions than what in fact has occurred by 2003 (which may, in part, show the impact of the resource shortfalls); and the ICPD did not assume changes toward more costly methods, which in fact occurred (a development that may reflect improvements in quality of care). The numbers are remarkably and reassuringly similar, given the different methods of estimation.

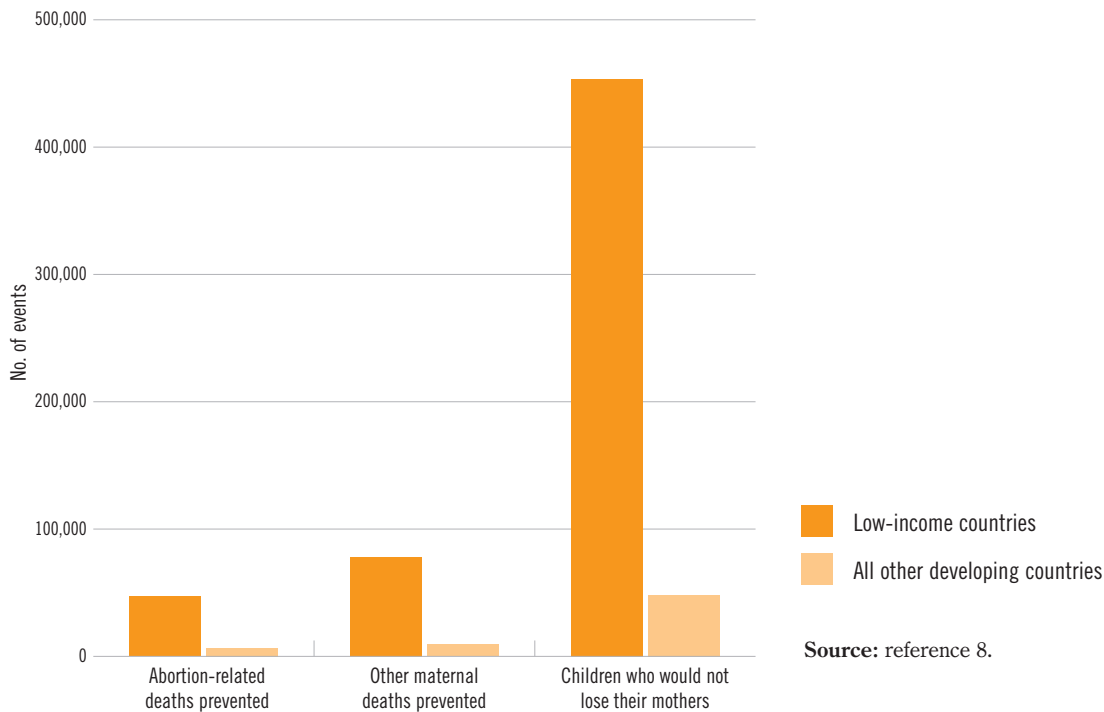


FIGURE 3.5 Low-income countries would reap most of the benefits if all need for contraceptives were met.

services with the same staff and infrastructure. Systems set up for the distribution of contraceptives may also carry other sexual and reproductive health commodities. Training to help staff guide clients in the selection of a contraceptive method will also help them address other sensitive sexual and reproductive health concerns.

Synergistic effects increase the medical benefits of contraception beyond those reported here. When people choose the condom as their contraceptive method, they also protect themselves against sexually transmitted infections (STIs), including HIV/AIDS. When providers perform a Pap test during a contraceptive visit, they can diagnose and treat cases of cervical cancer. Before inserting an IUD, providers screen for STIs, and can thus offer treatment and counseling for women who test positive. Women who regularly visit a clinic for contraceptive supplies are better linked into existing systems of health care, and so are more likely to seek prenatal care or obtain emergency obstetric care. The benefits of all three areas of sexual and reproductive health care are broad and overlapping.

A BROADER APPROACH TO MEASURING COSTS AND BENEFITS

Existing approaches to measuring the benefits and costs of health interventions, including the approaches that led to the estimates provided in the previous chapter, have focused on assessing and documenting the *medical* benefits of investment in health. This focus is understandable, given that health-related benefits are relatively easy to measure and that it is natural when evaluating an investment in health care to look first at the health-related benefits.

But to capture the full value of any health intervention, and to compare returns on investment, we must consider not only their benefits in terms of survival and physical health, but the larger question of how they contribute to economic development and social well-being. Particularly in the case of sexual and reproductive health services, nonmedical benefits represent a large and important component of the gains from interventions—but these benefits are extremely hard to quantify, and are often unacknowledged. Providing these services can help policymakers reach such goals as promoting gender equality, accelerating economic growth and productivity, improving social equity and expanding community and political participation.

This chapter describes the benefits of sexual and reproductive health interventions in a comprehensive way, linking them to specific development goals. It differentiates between documented benefits and those that have yet to be conclusively measured. The chapter also outlines the main components of cost estimates and some key issues in comparing the costs of different interventions.

Sexual and reproductive health services generate a range of benefits

The medical benefits of sexual and reproductive health interventions are substantial. They include the prevention of deaths due to HIV/AIDS, cancer, complications of childbirth and unsafe abortion; the prevention or minimization of conditions such as obstetric fistula, septicemia, endometriosis and sexual dysfunction; better nutritional status and decreased risk of anemia for women; and increased survival rates and better health for infants (see box, page 24).¹

Additional benefits emerge when services provided within one of the three areas of sexual and reproductive health care improve outcomes in another. Sexual and reproductive health services can also enhance the value of the wider health care system, particularly for women. For example:

- Postpartum counseling can include referrals to well-baby programs, gynecologic care, services related to sexually transmitted infections (STIs) and nonmedical services such as domestic abuse counseling.
- Contraceptive services can connect women with the modern health care system, sometimes for the first time. As a result, women are more likely to receive prenatal care, to have access to emergency obstetric care and to take their children to a clinic for well-baby care.
- Early diagnosis and treatment of some STIs, e.g., gonorrhea and chlamydia, can reduce the probability of HIV infection.
- Providers of contraceptive services often advise clients to use con-

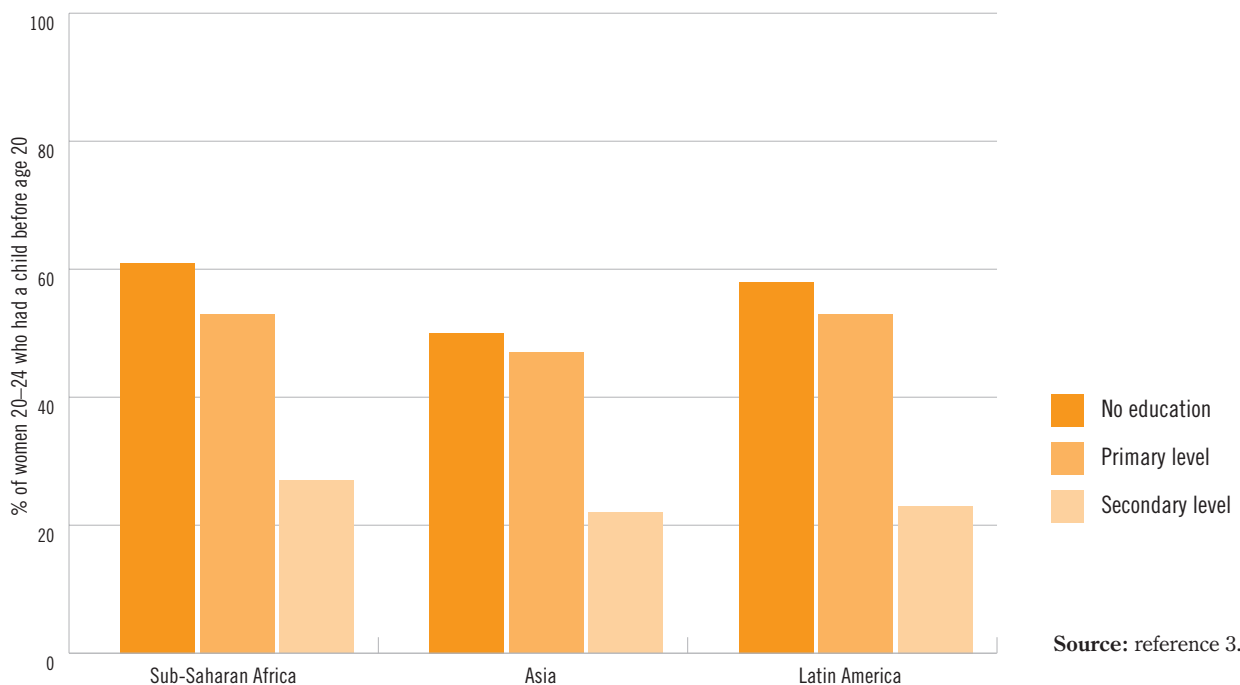


FIGURE 4.1 Women with less education are more likely to have children at a young age.

doms, which reduce transmission of STIs, including HIV/AIDS. This, in turn, can lead to improved pregnancy and delivery outcomes for women, and improved outcomes for their newborns.

- Postpartum and postabortion services often offer contraceptive counseling and services, which can help couples space their births and avoid recourse to abortion.

There is also a range of nonmedical—personal, social and economic—benefits of contraceptive services, maternal health services, and STI-related services and other gynecologic and urologic care (see boxes, pages 26–27). Many of these benefits have tremendous direct value in themselves, particularly for individuals and households. Even more compelling for policymakers are the benefits at the societal level and the contributions of these interventions to a range of development goals.

Improving women’s social position. All three areas of sexual and reproductive health services save women’s lives and reduce ill health. Sexual and reproductive health care can also improve women’s lives by preventing or correcting certain stigmatizing conditions and events that can affect their status in the family and in the community—among them infertility, premarital pregnancy, obstetric fistula, abortion and menstrual bleeding. Sexual and reproductive health programs can include education about these conditions and events, and counseling, diagnosis and treatment as needed, to reduce both their incidence wherever possible and the stigma attached to them.²

Furthermore, a first birth at a young age (younger than 20) can limit a woman’s prospects for education (Figure 4.1),³ training and employment, and, in the longer term, her earning power and financial security. While this has not been shown to be a causal relationship,⁴ the uniformity and strength of the association worldwide argues that delaying motherhood through the use of contraceptive services is likely to be an important factor contributing to women’s achieving higher education.

Women of all ages report that using contraception to time births and avoid unintended pregnancies improves their personal well-being and status in the household. Qualitative research shows that contraceptive use reduces stress about the risk of unplanned pregnancies and improves relationships between partners. In Bolivia, for example, women using contraceptives demonstrate greater self-esteem than nonusers, and in the Philippines, contraceptive users have reported greater overall satisfaction with their lives than nonusers. Women point out that delayed childbearing and smaller families, achieved through contraceptive use, allow more leisure time as well as educational and economic opportunities.⁵

Control over their fertility and the ability to contribute economically to the household may give women more confidence and decision-making power within the household. For example, contraceptive users in the Philippines are more likely than nonusers to join their husbands in making household decisions.⁶ Sex education and counseling may also improve women’s ability to communicate with their

EXAMPLES OF MEDICAL BENEFITS OF SEXUAL AND REPRODUCTIVE HEALTH SERVICES

Contraceptive services

- Help space births, resulting in
 - lower rates of infant and child mortality
 - decreased risk of anemia for mothers
 - more time to breastfeed, improving infant health and survival
- Prevent high-risk pregnancies among
 - very young adolescents
 - women in their late 30s and 40s
 - women who have had many births
 - women with preexisting medical conditions
- Prevent unsafe abortion resulting from unwanted pregnancies, thereby reducing
 - maternal deaths
 - ill health
 - infertility
- Prevent maternal and infant deaths and ill health resulting from unwanted births
- Facilitate screening for STIs and other health concerns

Maternal health services

- Prenatal care provides
 - education and counseling on healthy behaviors, diet and nutrition
 - opportunity for prompt intervention in case of complications
 - opportunity for management of ongoing conditions such as hypertension, anemia, malaria, hepatitis, tuberculosis and cardiovascular disease
- Obstetric care reduces probability and severity of
 - hemorrhage
 - infection
 - obstetric fistula
 - urinary or fecal incontinence
 - pelvic inflammatory disease
- Postpartum visits help
 - reduce infection
 - increase breastfeeding
 - improve nutrition
- Care for complications of unsafe abortion reduces mortality and severity of subsequent ill health and promotes subsequent contraceptive use

partners, leading to more equality in household decision-making.

The dynamics of smaller families reduce gender discrimination over the longer term. One study, in Ghana, found that children, particularly girls, in larger families were less likely to attend school and experienced greater inequality within the household than those with fewer siblings.⁷ By contributing to smaller families, contraception may contribute to female education and equality.

Maternal health care and contraceptive services also provide opportunities to screen women for gender-based violence and offer counseling. Pregnant women, especially, are subject to physical abuse;⁸ prenatal care providers can help women assess the danger to themselves and their children, and consider how to protect themselves.

Contributing to economic growth. By protecting and improving health, contraceptive services, maternal health services, and STI-related services and other gynecologic and urologic care, like other health interventions, increase productivity in the home and labor force, resulting in personal, household and societal economic benefits. However, sexual and reproductive health care differ from other health interventions in some important ways. For example:

- STIs, including HIV/AIDS, are most prevalent among young men and women. Preventing these infections will have a long-term impact on the labor force and productivity.
- Families with fewer children to support may be able to save more, contributing to greater investment and faster economic growth.

- With a smaller cohort of young people, spending on education can be channeled into improving the quality of schools and providing training for higher-skilled jobs.
- A smaller cohort of young people can more easily be absorbed into a country's labor force, reducing youth unemployment and despair, and contributing to greater stability and security.
- Maternal health care and STI-related services reduce deaths and disability among parents, resulting in better health for children, improved chances for their education and, longer term, higher productivity as adults.

Access to contraceptives offers powerful macroeconomic benefits by opening the “demographic window.”⁹ As a country goes through the demographic transition toward lower levels of mortality and fertility, a large cohort of young workers, born when birthrates were higher, enter their productive years. At the same time, parents are choosing to have fewer children and invest greater resources in each child. There are relatively few older people to support.

With relatively few dependents for each worker, the country has the opportunity to boost economic growth through higher short- and medium-term savings and investment. If the quality of governance during this period is such that the increased savings translates into efficient and productive investments, the gains can be large and long-lasting.

Finally, prevention and care in all three areas of sexual and repro-

STI-related services and gynecologic and urologic care

- Prevention and treatment of STIs, including HIV/AIDS
 - save lives and prevent ill health
 - reduce transmission among sexual partners and from mothers to infants
 - lower infertility
- Prevention and treatment of gonorrhea reduce
 - septicemia, arthritis and endocarditis in men
 - pelvic inflammatory disease and infertility among women
 - eye infections and blindness among infants
- Prevention and treatment of human papillomavirus (HPV) reduce prevalence of genital warts and cervical cancer
- Gynecologic and urologic care can prevent and reduce ill health and death from
 - cervical, breast and prostate cancer
 - endometriosis
 - fibroids and ovarian tumors
 - reproductive tract infections
 - sexual dysfunction

ductive health may reduce the need for subsequent public spending. Fewer deaths and better health among the reproductive-aged population decrease the number of orphans and families in need. Fewer unintended pregnancies mean fewer unwanted births and lower expenditures on education, health care and other social services. Preventing STIs and other gynecologic and urologic problems is cheaper than treating them.

Reducing poverty and inequality. The prime beneficiaries of public-sector sexual and reproductive health care are the poorest and most disadvantaged women and men, who would otherwise not be able to access care. Empirical studies from many countries demonstrate the benefits of small families in reducing poverty at the household level, and in improving education and health outcomes for children.¹⁰ The benefits work at many levels: Protecting the lives and health of parents protects their families from falling into poverty, better-off women are less likely than poor women to die in childbirth, and better-off infants and children are less likely to die than children in poor families.¹¹ And, as Chapter 3 notes, the bulk of benefits from expanded contraceptive services would accrue to women, children and families living in low-income countries.

Better health and smaller household workloads may lead to new economic possibilities and allow more opportunities for productive investments for poor women. For example, a study of women in Kenya found that the main reasons for late repayment of microcredit loans included expenses related to having a large family, includ-

ing diversion of funds to pay for medicines, school fees or housing costs.¹² Contraceptive services and maternal health care would help these women continue their entrepreneurial activities.

Expanding community and political participation. Men and women who are healthy and have fewer children to care for have more time for other things, including civic activities. In a survey of older married women in two urban areas of Indonesia, half the women reported that family planning enabled them to spend more time in community activities.¹³ An increased sense of power and confidence conferred by family planning may help women take a more active role in community and political life. Contraception and smaller families may have a cumulative effect: As women gain time and freedom to become involved in social and political issues, they increasingly advocate for and take advantage of contraceptive services.¹⁴

Costs of interventions must also be fully assessed

To fairly assess the value of a particular intervention, policymakers need cost estimates that are comprehensive and comparable across interventions. Clarity about which cost components are included in an estimate and their specific costs can be very useful, for example, to a donor agency that may be interested in supporting selected components.

Estimates should measure five main categories of direct costs:¹⁵

- supplies, including devices, drugs, test kits and materials;
- direct labor, including all levels of personnel;

EXAMPLES OF NONMEDICAL BENEFITS OF CONTRACEPTIVE SERVICES

Individual

- Greater satisfaction with life
- Less worry over unplanned pregnancy
- Greater self-esteem and efficacy, especially for women
- More decision-making power, especially for women
- More time with children
- Greater educational and employment opportunities, especially for girls and women
- Improved social status for women
- Increased opportunity to join social and civic organizations
- Greater financial security, especially for women
- Higher productivity and income

Family/household

- Increased ability of women to care for families
- Stronger, more stable marital relationships
- Promotion of joint household decision-making
- Less discrimination against female children
- More attention and parental care for each child
- Increased household income
- Higher health, nutrition and education expenditures per child
- Fewer orphaned children
- Improved living conditions through less crowding

Community/society

- Higher productivity and better incomes
- Less societal burden to care for neglected children
- Decreased inequality between men and women
- Rapid economic growth during the “demographic window”
- Higher savings and investment
- Improved productivity
- Reduced public expenditures in education, health care and other social services

- number and types of visits;
- facility overhead; and
- capital expenditures.

While there is general consensus on these categories, studies use a variety of definitions, approaches and methods, making it difficult to compare costs across studies. Users of cost estimates should determine which categories are included and be alert to differences in methodology.

Comprehensive estimates should include all costs, regardless of the source of funding—international donors, national or local governments, nongovernmental organizations, program clients or a combination of these. They should also include costs from the perspective of the client or patient who is using the services—both the time required to access services and the social sanctions that may stem from cultural perceptions of, for example, STIs, abortion or not having a child soon after marriage.

Cost comparisons. Studies of costs should provide enough information to allow users to judge the degree of comparability with other studies. Users must be alert to a number of factors:

- whether estimates include all five main categories of direct costs;
- whether estimates of publicly funded supplies and services include subsidies, and whether they include costs to clients such as out-of-pocket payments;
- whether estimates include only the cost of delivering the service

or related costs as well, such as training or programs for information, education and communication;

- whether estimates to be compared use the same definitions of overhead costs, rates of interest, ways of costing, voluntary labor and exchange rate conversions; and
- whether estimates were made in the same year or have been adjusted for inflation.

Context-specific factors. Apart from the specific estimation methodology, contextual or environmental factors can affect how the results of a cost study should be interpreted. Key areas to consider include the following:

- *Structure and content of services.* Related costs, not directly attributable to the service that is being delivered, may be included in the calculation. For example, if a clinic-based system offers a range of sexual and reproductive health (or even general health) services but attributes all personnel costs to family planning, it will overstate the actual cost of providing family planning. Services may also be integrated in one setting and separated in another, raising questions about how to allocate and compare costs across settings. Or services with similar names may vary in content (e.g., the mix of contraceptive methods or the type of procedure to treat an abortion complication), or in quality (e.g., health care providers may spend more or less time with each client, use different levels of counseling or apply different protocols).
- *Program phase.* A new program will often have high start-up costs

EXAMPLES OF NONMEDICAL BENEFITS OF MATERNAL HEALTH SERVICES

Individual

- Reduction in postpartum depression and puerperal psychosis
- Reduction in stigma related to infertility, abortion and obstetric fistula
- Increased productivity and income

Family/household

- More time for mothers to care for children
- Fewer maternal deaths and fewer children orphaned
- Higher household income and savings

Community/society

- Lower maternal mortality
- Lower costs of caring for maternal health complications
- Higher productivity and investment

EXAMPLES OF NONMEDICAL BENEFITS OF STI-RELATED SERVICES AND OTHER GYNECOLOGIC AND UROLOGIC CARE

Individual

- Prevention of infertility and sterility
- Stronger, more stable sexual relationships
- Reduced stigma surrounding HIV/AIDS and infertility
- Greater ability for infected persons to work and earn an income

Family/household

- Better support to families by healthy parents
- Fewer orphans
- Greater household income and savings
- Opportunity for couples to discuss intimate concerns

Community/society

- Fewer orphaned children
- Fewer families in need of subsidies
- Higher productivity and investment
- Reduced public expenditures through prevention of STIs, rather than through treatment

and a low volume of users, and thus will have a higher unit cost (e.g., per visit or per user) than an established program with only ongoing costs and a high volume of clients. On the other hand, a closely monitored pilot program may have lower unit costs than a large-scale program coping with real-world conditions, such as underutilization of capacity, poor coordination or corruption.¹⁶

- *Number and types of clients.* Programs serving high-risk or hard-to-reach populations often have higher average costs than others. Programs with large numbers of clients and more visits often enjoy economies of scale, putting available facilities and personnel to full use and making bulk commodity purchases feasible.

Documenting the full range of costs and benefits will enable more informed choices

The personal, social and economic benefits of sexual and reproductive health care may be difficult to measure, but they are extremely important, both for human welfare and for economic development. Much more needs to be done to measure these broader benefits and recognize their importance.

Researchers and decision-makers alike need to be more flexible and open to a range of outcomes and ways to measure them. Studies should include health measures beyond loss of life or physical function, such as measures of emotional or mental well-being. They should also look at measurable nonmedical outcomes, and should test the relationship between these outcomes and service inputs. For example, delaying a first birth and spacing births are measur-

able outcomes of contraceptive use. They can, in turn, have measurable outcomes for individuals (such as improving job stability or progress in a career) and for families (such as a higher standard of living, opportunities available to children or the amount of time parents spend with each child).

It may not always be possible to quantify the benefits of a health intervention by demonstrating a causal relationship, but statistical evidence may link an intervention and an outcome. Qualitative research can help to document some benefits, such as the effect of improved maternal health on children's well-being or the effect of reduced social stigma on women's empowerment.

It may also not be possible to express certain costs and benefits of some health interventions in dollars or DALYs, but it is imperative to find a better way than simply excluding them on that account from cost-benefit calculations and comparisons. Putting the full range of costs and benefits at decision-makers' disposal will help them make fully informed choices among programs. Giving them the best evidence will allow them to choose the most cost-effective, as well as the most valuable, policies and programs to support.

SUMMARY AND CONCLUSIONS

With the Millennium Development Goals, world leaders have outlined an ambitious framework for action on the part of both rich and poor countries. Sexual and reproductive health is essential to achieving all of these goals. Indeed, some of the indicators chosen to measure progress toward these goals assess selected sexual and reproductive health achievements. For example, the proportion of births attended by skilled health personnel is an indicator of progress toward the maternal health goal; the HIV prevalence rate among 15–24-year-old pregnant women and the condom prevalence rate among married women 15–49 are indicators of progress in the fight against HIV/AIDS.¹

Other aspects of sexual and reproductive health also underlie the Millennium Development Goals but are not explicitly mentioned. This is in part because many of the indirect benefits of sexual and reproductive health are difficult to measure. For example, contraceptive services help couples to have smaller families, and in this way enable poor families to invest more resources in each child. This additional investment improves nutrition in the short term, and over the longer term helps children prepare to support themselves through education and training. In this way, contraceptive services certainly promote the first Millennium Development Goal—“Eradicate extreme poverty and hunger”—although no measure has been developed to evaluate their contribution.

*The United Nations Population Fund (UNFPA) report cited in reference 2 summarizes within-country differentials for the 44 countries included in the World Bank’s series *Socioeconomic Differences in Health, Nutrition, and Population*.

Poor sexual and reproductive health accounts for a large share of the global burden of disease

Analyses such as those by the Global Burden of Disease and Disease Control Priorities for Developing Countries projects, the World Bank (in its 1993 *World Development Report*) and the Commission on Macroeconomics and Health have made great strides toward quantifying the benefits of health interventions. They have shown that poor sexual and reproductive health accounts for a substantial share—nearly one-fifth—of the global burden of disease, and that sexual and reproductive health interventions are a good investment.

These and other studies show that the impact of poor sexual and reproductive health falls hardest on the most disadvantaged groups, especially women and children, and disproportionately affects people in low-income countries.^{2*} For example, sexual and reproductive health conditions account for nearly two-thirds of disability-adjusted life years (DALYs) lost among women of reproductive age in Sub-Saharan Africa, compared with about one-third worldwide (Figure 5.1).³ Adolescent women, both married and unmarried, are at high risk of poor sexual and reproductive health outcomes; married adolescents in particular may lack power to use contraceptives or to avoid acquiring a sexually transmitted infection (STI) through their often much older husbands.⁴ Both married and unmarried sexually active adolescent women also experience significant levels of unplanned pregnancy and unmet need for contraception.⁵

Much has changed in the health sector since these extensive

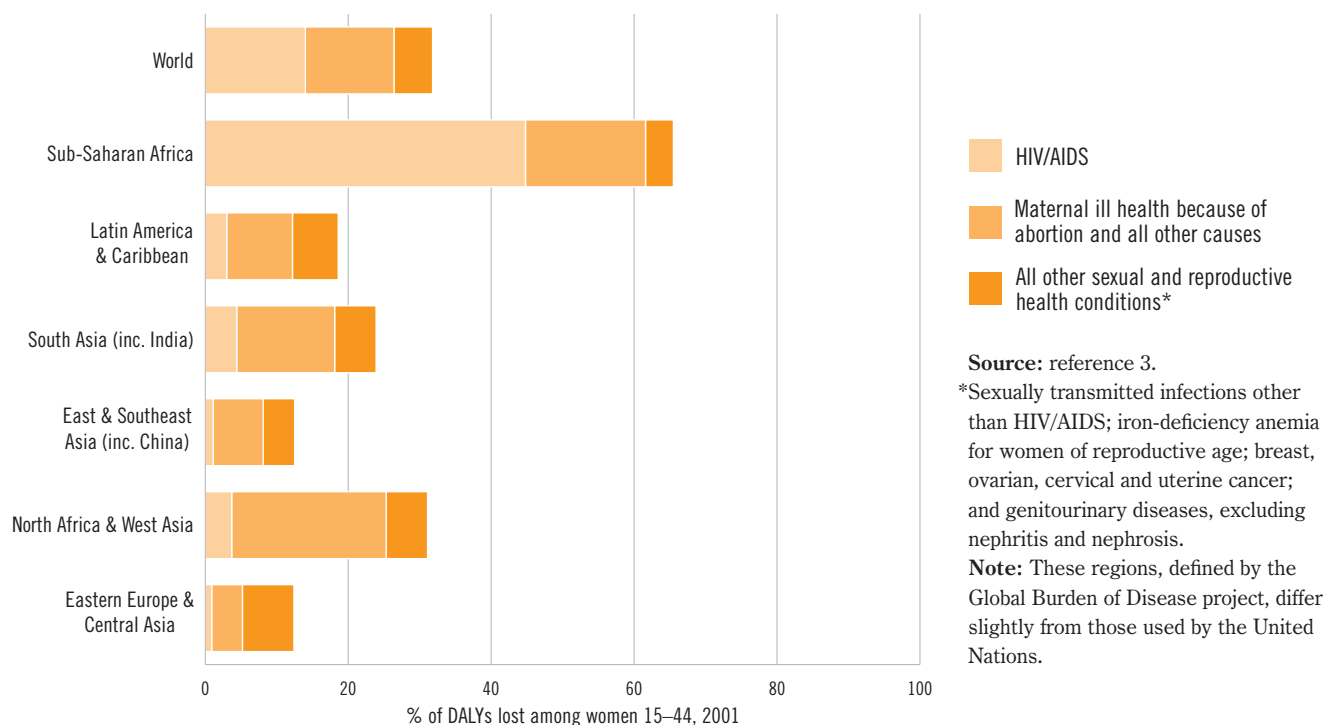


FIGURE 5.1 Women in Sub-Saharan Africa suffer more than women in other regions from sexual and reproductive ill health.

assessment efforts began in the 1990s. Health-sector reforms have changed the cost of services, who pays for them and whom they cover, as well as the content and structure of services available. The HIV/AIDS pandemic has shifted the burden of disease and disability, both overall and within the area of sexual and reproductive health (Figure 5.2, page 30).⁶ Nevertheless, the studies of the last decade provide a firm base for future research and action.

The benefits of sexual and reproductive health interventions are far-reaching

Current approaches largely fail to recognize the nonmedical benefits of sexual and reproductive health interventions and thus undervalue these interventions. For example, in addition to its medical benefits, maternal health care helps families remain intact, enables higher household savings and investment, and encourages higher productivity. Prevention of and treatment for STIs, and treatment for conditions like fistula and infertility, also reduce social stigma and help parents remain healthy, so they are better able to care for and invest in their children. Healthy families can earn more and save more, spurring economic growth.

Current methods of evaluating costs and benefits are more likely to undervalue contraceptive services than the other components of sexual and reproductive health because, as noted earlier, pregnancy—the condition contraceptive use prevents—is not a disease. However, as this report has shown, contraceptive services have important medical benefits. In addition, they have the broadest nonmedical benefits

of the three areas of sexual and reproductive health interventions.

In terms of medical benefits, contraceptive use (together with maternal health services) minimizes the adverse health effects of unintended pregnancy and high-risk births, including unsafe abortion, hemorrhage, infection, anemia, low birth weight and malnutrition. This report shows that if modern contraceptive services were available to all 201 million women in the developing world with unmet need, 1.5 million lives would be saved each year. Approximately 27 million DALYs would be saved, opening the way for higher productivity, additional education and enhanced family care. And each year, some 505,000 fewer children would lose their mothers.

As striking as these numbers are, the personal, social and economic benefits of contraceptive services may be even more important. Unintended pregnancy, which contraceptive use prevents, can harm individuals, families, communities and societies in ways that are difficult to measure in dollars or DALYs.

Future research should concentrate on finding approaches and methodologies to quantify more of the benefits of sexual and reproductive health care, and to do so in ways that are sufficiently similar across studies and across interventions to allow results to be compared. Assessments should

- recognize that a range of benefits may need to be measured;
- include findings from explanatory research as evidence of impact;
- look to plausible statistical correlations when a causal relation-

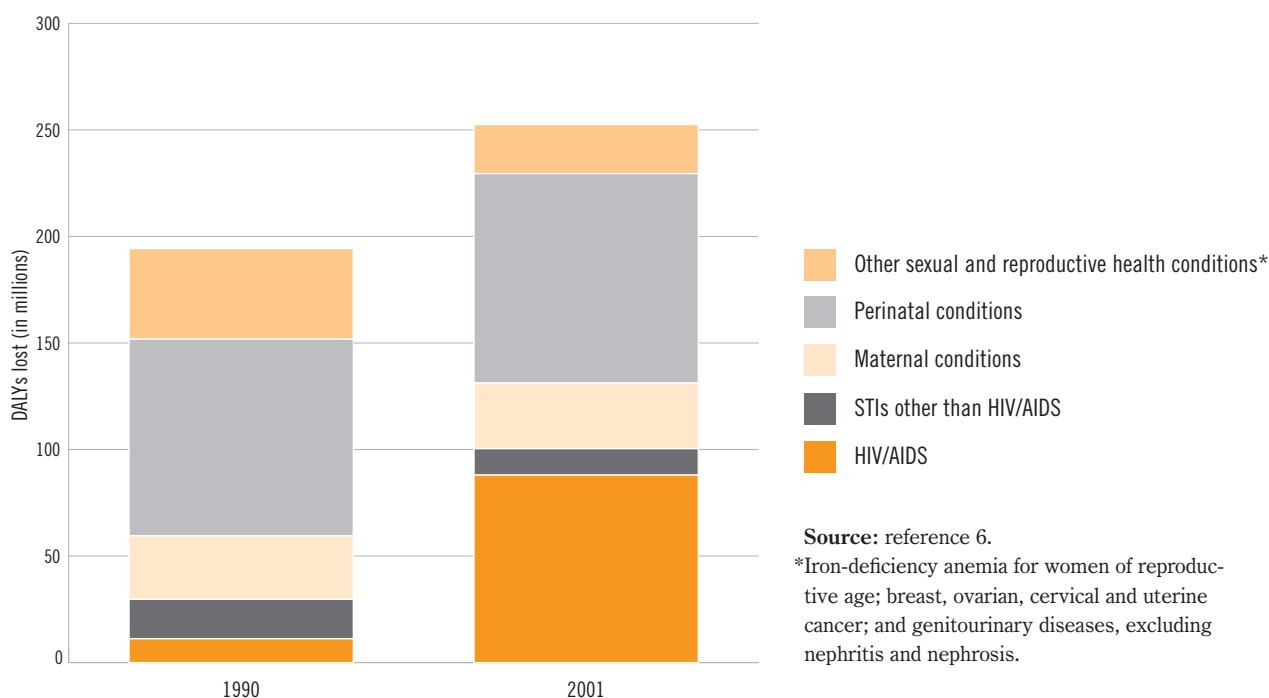


FIGURE 5.2 HIV/AIDS has become a major cause of sexual and reproductive ill health worldwide.

ship cannot be determined;

- recognize that alternative, qualitative methodologies may be necessary to document unquantifiable benefits and costs; and
- ensure that cost comparisons are complete and accurate.

More comprehensive cost and benefit studies are needed at all levels to meet the needs of decision-makers. Policymakers, for their part, must keep in mind the breadth and synergies of sexual and reproductive health benefits, and when they use existing studies, add due weight for indirect as well as nonmedical and nonmonetary benefits, even if measures to compare them with financial and medical benefits are lacking.

Poor sexual and reproductive health is largely preventable, but sustained support is needed

Contraceptive services offering a choice of methods, including condoms, as well as education and counseling can help individuals and couples protect themselves from unintended pregnancies and STIs, including HIV/AIDS. Regular gynecologic and urologic care can prevent and treat reproductive cancers and other disorders. Pregnancy and childbirth do entail health risks, even when they are planned, but these can be mitigated through prenatal and obstetric care. Effective sexual and reproductive health services could save a substantial proportion of the DALYs lost each year.

It is also important for policymakers and planners to take into account the fact that, unlike needs in many other aspects of health,

prevention in the area of sexual and reproductive health is ongoing. The risk of unintended pregnancy, for example, can span decades of a woman's life, and people may be at risk of exposure to STIs for as long as they are sexually active. Health improvements and progress towards larger development goals that have been achieved can be greatly weakened and possibly reversed, if current levels of interventions are not sustained.

Sexual and reproductive health interventions are a good investment

This report makes the case for mobilizing new resources to invest in improved sexual and reproductive health services for women and men worldwide. Individuals, nongovernmental organizations and governments in developing countries already account for more than 75% of current expenditures.⁷ While the developing countries must continue investing in sexual and reproductive health services, it is time for developed countries to live up to the pledges they made at the 1994 International Conference on Population and Development (ICPD). In 2000, these countries provided \$2.6 billion for sexual and reproductive health services in developing countries—less than half of what they had pledged at ICPD for that year.

Turning back the HIV/AIDS pandemic, helping women balance work and family, and preventing maternal deaths, sterility and infertility are ambitious aims, but they are realistic. They are also necessary for achieving the Millennium Development Goals by 2015.

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DEFINITIONS, METHODOLOGY AND DATA SOURCES

Women of reproductive age, by country and by marital status: The number of women of reproductive age (15–49) in 2003, by country, was estimated from the United Nations Population Division, Department of Economic and Social Affairs, *2002 World Population Prospects*, New York: United Nations, 2003. **Marital status** (currently married, formerly married and never married) of women 15–49 was taken from several sources, listed here in order of priority.

1. The most recent Demographic and Health Survey (DHS) for a country, from ORC Macro, MEASURE DHS+STATcompiler, 2003, <www.measuredhs.com/statcompiler>, accessed May 28, 2003.
2. Ross J, Stover J and Willard A, *Profiles for Family Planning and Reproductive Health Programs*, Glastonbury, CT, USA: The Futures Group International, 1999, Appendix Table A-7.
3. United Nations Population Division, Database on Marriage Patterns, unpublished data provided June 5, 2002.
4. Estimates based on the (unweighted) average of countries with DHS data within the relevant subregion.
5. Estimates based on DHS data available for a country in that region that has similar marriage patterns.

Women at risk for unintended pregnancy was defined as all women who are sexually active, are able to become pregnant, and either do not want any (more) children (limiters) or do not want a child within the next two years (spacers).

Contraceptive method use categories were sterilization (male or female); modern reversible methods—IUD, long-acting hormonal methods (injectable and implant), the pill, the condom, vaginal barrier methods and spermicides; and traditional methods—periodic abstinence, withdrawal and other nonmodern methods.

Unmet need for contraceptive services was defined as women at risk for unintended pregnancy who were using a traditional method or no method.

Distribution of women 15–49 by risk for unintended pregnancy, contraceptive method use and fertility-preference status (spacing or limiting), according to marital status was tabulated from several sources.

1. For all countries with a DHS survey from 1990 or later that was available as a public use file, the most recent DHS was used.
2. For countries with a relevant survey, but without a public use file (in most cases surveys implemented by the U.S. Centers for Disease Control and Prevention; in a few cases, recent DHS or independently conducted surveys), proportions available from published reports were used.
3. For any other country that did not have a nationally representative fertility survey, either the unweighted average distribution of its subregion based on countries in the subregion that had surveys, or the distribution from a country that is at a similar level of demographic transition in the same subregion, was used.

Cost of contraceptive services: Average costs per method are from United Nations Population Fund (UNFPA), *Compilation of costs of sexual and reproductive health interventions*, from over 500 studies worldwide, 2002, <http://bbs.unfpa.org/spcd/costing/group_gc.cfm?category=GC&component_id=77>, accessed with permission from UNFPA on Feb. 28, 2003 (public access planned at www.unfpa.org/rhcosting). For each method, the average cost includes labor, drugs and supplies, overhead (including capital costs, although these are likely to be incompletely reported) and other costs.

Costs of long-term methods were annualized, applying standard assumptions. (These assumptions—10 years for sterilization and three years for the IUD—are outlined in Janowitz B, Bratt JH and Fried DB, *Investing in the Future: A Report of the Cost of Family Planning in the Year 2000*, Research Triangle Park, NC, USA: Family Health International, 1990.) For other methods, the estimates are based on supplying 13 cycles of oral contraceptives, 96 condoms or four injections per year. Costs were provided in 2001 dollars, and were adjusted by a factor of 4% to 2003 dollars.

Pregnancies averted: The number of pregnancies averted by current use of modern contraceptive methods was estimated by subtracting the number of pregnancies occurring to current users of modern contraceptives from the number that would occur if they used no method.

The number of pregnancies that *would be averted* by serving all those with unmet need for contraceptive services was estimated as the difference between the number of pregnancies currently occurring to women with unmet need and the number that would occur if they used modern contraceptive methods (in the same distribution as women in their country who are current users, by fertility-preference status and marital status).

Pregnancy rates for women using each method and women using no method were estimated from method-specific use-failure rates, which were adjusted to be consistent with estimates of the number of unintended pregnancies in 2003 for each major region. The number of unintended pregnancies was taken from The Alan Guttmacher Institute (AGI), *Sharing Responsibility: Women, Society and Abortion Worldwide*, New York: AGI, 1999, Appendix Table 3, p. 53; and AGI, unpublished tabulations by region. These estimated numbers were adjusted to 2003 based on the ratio of 2003 births (see “Number of women of reproductive age,” above) to 1999 births.

Base use-failure rates for **sterilization** are from Trussell J et al., Contraceptive failure in the United States: an update, *Studies in Family Planning*, 1990, 21(1):51–54. Initial use-failure rates for **reversible methods** are from Cleland J and Ali M, Dynamics of contraceptive use, in: United Nations, *Levels and Trends of Contraceptive Use as Assessed in 2002*, New York: United Nations, 2003 (forthcoming). For **no method** use, an initial annual pregnancy rate of 40% was assumed.*

Pregnancy outcomes: It was assumed that all pregnancies to women at risk for unintended pregnancy would be unplanned pregnancies. They were distributed according to outcome (unplanned births, abortions and miscarriages) based on the distribution of outcomes of unplanned pregnancies for subregions from AGI, 1999 and AGI, unpublished tabulations (see “Pregnancy rates,” above). Subregional averages were applied to all countries within that subregion.

Maternal deaths: The numbers of maternal deaths due to abortion and to all other pregnancy-related causes were estimated by drawing on data from several sources. **The number of maternal deaths from all pregnancy-related causes** for each country in 2003 was estimated by multiplying the ratio of the number of births in 2003 to the number in 2000, estimated from United Nations Population Division, 2003 (see “Number of women of reproductive age,” above) times the number of maternal deaths in 2000 estimated in AbouZahr C and Wardlaw T, *Maternal Mortality in 2000: Estimates Developed by WHO, UNICEF and UNFPA*, Geneva: World Health Organizations (WHO), 2003. **Maternal mortality from unsafe abortion:** Estimates of the number of maternal deaths from unsafe abortion,[†] the number of unsafe abortions and the rates of deaths per 100,000 unsafe abortions, by region, were taken from estimates for 2000 from Åhman E and Shah I, *Unsafe Abortion: Global and Regional Estimates of the Incidence of Unsafe*

Abortion, Geneva: WHO, 2003 (forthcoming), Table 3. Regional averages were applied to all countries in a region. **Maternal mortality from abortion where it is legal and/or in medical settings:** The number of safe abortions in legal settings was estimated for each region by subtracting the number of unsafe abortions (from Åhman and Shah, 2003) from the total number of induced abortions (from AGI, 1999; and AGI, unpublished tabulations—see “Pregnancy rates,” above), and distributed across countries based on the legal status of abortion. Mortality rates per 100,000 abortions in safe and legal settings were based on experience in developed countries reported in AGI, 1999. **Maternal mortality ratios from causes other than induced abortion** were estimated for each country by subtracting maternal deaths related to abortion from maternal deaths from all pregnancy-related causes and expressed as a rate per 100,000 live births.

Infant deaths: The infant mortality rate (deaths under age 1 per 1,000 live births) for 2000–2005, by country, was applied to the relevant number of births to calculate the number of infant deaths. United Nations Population Division, 2003 (see “Number of women of reproductive age,” above).

Children who would not lose their mothers: The number of maternal deaths was multiplied by the average number of living children women have had to estimate the number of children impacted by maternal deaths. Estimates are based on the average number of living children women have had, according to whether they are spacers or limiters and according to type of method use (sterilization, modern reversible, traditional or no method), by union status. DHS data were used when available. When DHS data were not available, subregional (unweighted) averages were used. When DHS data were not available for computing subregional averages, estimates of the mean number of living children were based on results for similar countries in the subregion or in a similar region.

Disability-Adjusted Life Years (DALYs): The number of DALYs lost among infants and children was estimated based on the number of DALYs lost per 1,000 births because of perinatal conditions, by subregion, in 2001. These rates were then applied to unintended births in 2003, in each country in the subregion, according to subgroups of women, for example, current contraceptive users and nonusers.

The number of DALYs lost among women because of maternal conditions other than induced abortion was estimated based on the number of DALYs lost per 1,000 births from all maternal conditions except induced abortion, by subregion, in 2001. These rates were then applied to unintended births in 2003, in each country in the subregion, according to subgroups of women, for example, current contraceptive users and nonusers.

The number of DALYs lost among women because of induced abortions was estimated from the number of DALYs lost due to induced abortion per 1,000 births in 2001, by subregion, multiplied by the ratio of 2003 births to 2003 abortions.

*This 40% estimate is much lower than the 85% annual pregnancy rate that Trussell et al. estimate for couples continually sexually active throughout a year's time. Some studies have suggested that couples at risk of unintended pregnancy who are using no contraceptive method are not continually sexually active. See, for example, Blanc AK and Grey S, Greater than expected fertility decline in Ghana: untangling a puzzle, *Journal of Biosocial Science*, 2002, 34:475–495; and Grady WR, Hayward MD and Yagi J, Contraceptive failure in the United States: estimates from the 1982 National Survey of Family Growth, *Family Planning Perspectives*, 1986, 18(5):200–204 & 207–209.

†The estimated number of unsafe abortions includes those provided in countries where the procedure is highly restricted, and those provided under unsafe conditions in countries where abortion is permitted under broad legal grounds.

DALYs lost in 2001 because of each cause, by subregion, were obtained from WHO, Estimates of DALYs by sex, cause and WHO mortality sub-region, estimates for 2001, 2002, <http://www3.who.int/whosis/menu.cfm?path=evidence,burden,burden_estimates,burden_estimates_2001,burden_estimates_2001_subregion&language=english>, accessed July 9, 2003. Births in 2001 and 2003 were from United Nations Population Division, 2003 (see “Number of women of reproductive age,” above). Abortions in 2003 were from AGI, 1999; and AGI, unpublished tabulations (see “Pregnancy rate,” above).

A more detailed explanation of the methodology is available in Vlassoff M et al., *Costs and Benefits of Providing Sexual and Reproductive Health Services: A Review*, Occasional Report, New York: AGI, 2004, No. 11 (forthcoming).

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