



ADDING IT UP

The Costs and Benefits of Investing in
Sexual and Reproductive Health **2014**



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Executive Summary

Women need sexual and reproductive health services from adolescence through the end of their reproductive years, whether or not they have a birth, and those who give birth need essential care to protect their health and ensure their newborns survive. The declines in maternal and infant deaths in developing countries in the last decade are a welcome sign that increased global attention and resources devoted to safe motherhood and child survival are paying off.

Still, disparities in maternal and newborn deaths between the wealthy and poor countries of the world are far too wide, especially given that most of these deaths could be prevented with existing knowledge and technology. Across all world regions, the greatest burden of ill-health among women and infants is concentrated in places where health systems are weak and services are unavailable or inadequate. Thus, much more work remains to be done to provide essential health services to the poorest and most vulnerable people, and information is needed to guide action and investment.

New estimates for 2014 show that sexual and reproductive health services fall well short of needs in developing regions. An estimated 225 million women who want to avoid a pregnancy are not using an effective contraceptive method. Because increases in contraceptive use have barely kept up with growing populations, this number is virtually unchanged since the *Adding It Up* report for 2008.

Of the 125 million women who give birth each year,

- 54 million make fewer than the minimum of four antenatal visits recommended by the World Health Organization (WHO);
- 43 million do not deliver their babies in a health facility;
- 21 million need but do not receive care for major obstetric complications;
- 33 million have newborns who need but do not

receive care for health complications; and

- 1.5 million are living with HIV, more than one-third of whom are not receiving the antiretroviral care they need to prevent transmission of the virus to their newborns and to protect their own health.

Another 65 million women each year have a pregnancy that ends in a miscarriage, stillbirth or abortion. Among these women, a substantial number are not receiving the medical care they need.

For instance,

- seven million do not receive adequate antenatal care;
- five million do not get facility-based care at the time of a miscarriage or stillbirth; and
- just over three million with complications from unsafe abortions do not receive post-abortion care.

If all women who want to avoid a pregnancy used modern contraceptives *and* all pregnant women and their newborns received care at the standards recommended by WHO, the benefits would be dramatic.

Compared with the current situation,

- unintended pregnancies would drop by 70%, from 74 million to 22 million per year;
- maternal deaths would drop by 67%, from 290,000 to 96,000;
- newborn deaths would drop by 77%, from 2.9 million to 660,000;
- the burden of disability related to pregnancy and delivery experienced by women and newborns would drop by two-thirds; and
- transmission of HIV from mothers to newborns would be nearly eliminated—achieving a 93% reduction to 9,000 cases annually.

STIs other than HIV receive relatively little attention but take an enormous toll on women's reproductive health. In developing regions each year, an estimated 204 million women have one of the four major curable STIs (chlamydia, gonorrhea, syphilis

An estimated 225 million women who want to avoid a pregnancy are not using an effective contraceptive method.

or trichomoniasis), but 170 million (82%) do not receive STI services. Although data are limited, new estimates reveal that compared with the current situation,

- fully meeting women's need for chlamydia and gonorrhea treatment would prevent 27 million women from developing pelvic inflammatory disease and seven million of these women from developing infertility; and
- fully meeting women's need for syphilis screening and treatment during pregnancy would prevent 110,000 fetal deaths and stillbirths and 50,000 deaths among newborns, and would also prevent 100,000 infants from being born with syphilis.

How much would it cost to provide a package of sexual and reproductive health services for all sexually active women and their newborns?

- Fully meeting the need for modern contraceptive services would cost \$9.4 billion.
- Providing the recommended levels of maternal and newborn health care for women who have a live birth would cost \$21.7 billion.
- Providing the recommended care for women whose pregnancies end in miscarriage, stillbirth and abortion (assuming no change in relevant laws or practice) would cost \$2.0 billion annually.
- Meeting the need for HIV testing and counseling for all pregnant women and antiretroviral treatment for those living with HIV (during pregnancy and up to six weeks after delivery) would cost \$3.0 billion.
- Meeting the needs of newborns for testing and treatment related to HIV in the first six weeks of their lives would cost \$1.3 billion.
- Treating the major curable STIs for all women of reproductive age would cost \$1.7 billion.

These investments, if made together, would bring the total cost of sexual and reproductive health care to \$39.2 billion annually. The total represents more than a doubling of the current costs of these services, but amounts to only \$25 per woman of reproductive age annually, or \$7 per person in the developing world.

The additional investments would not only have major health benefits; they would also be cost-effective, because helping women choose the number and timing of their pregnancies makes health care more affordable overall. With far fewer unintended pregnancies, the cost of improving pregnancy and newborn care and preventing mother-to-child

transmission of HIV is much lower than it would be otherwise. Spending one dollar for contraceptive services reduces the cost of pregnancy-related care, including care for women living with HIV, by \$1.47. In addition, the results of a limited analysis on services for STIs other than HIV suggest that the burden of illness is so large and solutions so cost-effective that STI services are long overdue for additional investment.

As with current spending, the additional funds must come from the individuals who receive the services and national governments—who together account for the largest share of expenditures—and from contributions from NGOs and international donor agencies. Discussions about the needed funds, however, must take into account that the people most in need of services are among the least able to pay. Low- and lower-middle-income countries account for 80% of the increase in spending needed to fully meet all unmet needs for sexual and reproductive health care. Latin America accounts for only 4% of the total increase, while Africa (where health systems are in greatest need of strengthening) accounts for 71% and Asia for the remaining 25%.

Investments in sexual and reproductive health are critical for saving lives and reducing ill-health among women and their children—and for fulfilling their internationally recognized right to good health. The immediate health benefits alone are well worth the cost, and the payoffs are even greater when taking into account the broader, long-term benefits for women, their partners and families, and societies. These include increases in women's education and earnings, increases in household savings and assets, increases in children's schooling, increases in GDP growth and reductions in poverty.

Recent improvements in the health of women and newborns in developing countries have given the world hope that the health problems related to pregnancy and childbirth that industrialized countries addressed long ago would soon be resolved in poorer countries as well. However, much more work remains to be done to reach the poorest and most vulnerable people. With sufficient resources and political will, the poorest women and families will see substantial gains from additional investments—and nations as a whole will see greater progress toward achieving their development goals.

Spending one dollar for contraceptive services reduces the cost of pregnancy-related care by \$1.47.

1

Introduction

Sexual and reproductive health and rights are central to people's lives and essential for their well-being. In practice, this means that women and couples must have the means to have a healthy sexual life, have the number of children they want when they want them, deliver their babies safely and ensure their newborns survive. In developing regions as a whole, declines in unintended pregnancy, maternal and infant mortality, HIV prevalence and AIDS mortality in the last decade have been striking.¹⁻³ Some of the gains have occurred in the world's poorest countries, thanks to increased political commitments to health and investments in interventions that are known to be effective. Disparities among and within countries remain wide, however, and the poorest people face the greatest health challenges. Far too many women continue to have unintended pregnancies that could be avoided, STIs that could be prevented or treated, and complications related to pregnancy and childbirth that could be better managed. Newborn deaths (those occurring in the first month of life) have declined more slowly than deaths among older infants, and therefore they account for an increasing share of all childhood deaths. In addition, HIV, other STIs and cervical cancer (which is caused by an STI), continue to be widespread. Therefore, investments in sexual and reproductive health must be sustained and increased if all women, their partners and their families are to benefit from today's knowledge and technology.

To help decision-makers evaluate the investments needed in developing countries, this report provides new estimates, for 2014, of the needs for and costs and benefits of sexual and reproductive health interventions in three key areas:

- Contraceptive services
- Maternal, newborn and other pregnancy-related care
- Selected services related to HIV and other STIs for women of reproductive age

The report shows the immediate and direct benefits of investing in each set of interventions individually and the additional benefits of investing in them all simultaneously, as well as the cost implications of the investments. It also summarizes important findings from other studies that have quantified the broad, long-term benefits of these investments for individuals and societies. This report focuses in particular on the populations with the greatest needs for services, to highlight those who are most vulnerable and dependent on public-sector care and subsidies. Assessing the differences among population subgroups, countries and geographic regions can help guide national governments and international agencies in allocating resources and making other program decisions that would help to close existing gaps in services.

The report does not examine men's sexual and reproductive health needs independently from those of women, although men's needs are critical to address in their own right.⁴ Rather, this report looks at the sexual and reproductive health care that women need and use over the course of their lives and identifies gaps in services that, if filled, could improve their health, as well as that of their partners and children. A large body of research shows that when women and their children survive and thrive, their families are on surer financial footing, and gains can also be seen in education, employment and the economy.⁵⁻⁷

Advancing sexual and reproductive health and rights is a longstanding goal

Sexual and reproductive health and rights are about more than dollars and cents, however. The United Nations (UN) and the global health and development community have supported sexual and reproductive health and related rights as a fundamental component of people's well-being. The 1994 International Conference on Population and Development (ICPD) Program of Action defined reproductive health to include sexual health; acknowledged that health

This report focuses on the populations with the greatest need for services.

encompasses, as the World Health Organization's (WHO) charter indicates, more than avoidance of illness and death; and called for universal access to reproductive health care.⁸ It also defined reproductive rights to include the right of all individuals and couples to information, education, the means to decide the number and timing of one's births, and the means to attain the highest standard of sexual and reproductive health, free from coercion, violence and discrimination.⁹ The UN's twenty-year review of progress, in 2014, reaffirmed the importance of advancing these rights.¹⁰

Improving sexual and reproductive health and rights contributes to reducing poverty and achieving other development goals.¹¹ Of the eight UN Millennium Development Goals (MDGs), three goals—to reduce child mortality, to improve maternal health and to combat AIDS—rely directly on sexual and reproductive health care. Despite much progress, which this report will describe, most countries will not achieve the specific targets that were set for 2015.^{12,13} As world leaders craft a new development agenda for 2015 and beyond, they will likely give greater attention than in the past to reducing the wide disparities that exist everywhere between poorer and better-off women and between poorer and richer countries in developing regions. The first and overriding recommendation made by an expert panel that convened to consider the post-2015 agenda was to “leave no one behind.”¹⁴

To craft the new agenda, data and evidence are needed for setting and monitoring health and development goals. This report supports that effort, as well as other sexual and reproductive health initiatives already underway that aim to mobilize funding and action in developing countries. These include the following:

- *Family Planning 2020 (FP2020)*. Launched during a 2012 summit in London, the initiative has refocused attention on the large gaps between the need for and use of modern contraceptives in the 69 poorest developing countries—those with per capita incomes of \$2,500 or less in 2010. Since the summit, governments and nongovernmental organizations worldwide have committed to improving services in those countries by addressing the barriers that prevent people from using contraceptives.¹⁵
- *Global AIDS plan for children and their mothers*. In 2011, an international task force developed a four-year “Global Plan Towards the Elimination of HIV Among Children by 2015 and Keeping Their Mothers Alive.” The plan calls for renewed efforts to

make antiretroviral medicines available to pregnant women in the 22 countries that account for 90% of new HIV infections among children.¹⁶ It also calls for reducing HIV-related maternal deaths by 50%.

- *Global Strategy for Women's and Children's Health*. Launched in 2010, this UN initiative aims to accelerate progress in reducing maternal and child deaths.¹⁷ The strategy calls for governments to ensure that maternal, newborn and child health care is included in the package of essential health services that is available to everyone. It is implemented under the umbrella effort, Every Woman Every Child, which includes about 300 national and international partners.¹⁸
- *UNFPA's Global Programme to Enhance Reproductive Health Commodity Security*. Established in 2007 by the United Nations Population Fund, the program works to ensure that governments in developing countries have access to a reliable supply of contraceptives, condoms, medicine and equipment for family planning, prevention of HIV and other STIs, and maternal health services.¹⁹

These initiatives share a common aim of reaching the poorest people, who have yet to benefit fully from the knowledge and technology that have improved the health and lives of millions of others.

Guide to this report

This report builds on prior *Adding It Up* reports that provided estimates for 2003, 2008 and 2012. The 2003 report showed the costs and benefits of investing in contraceptive care in developing countries, providing clear evidence that these services are a “best buy” for global health and development.²⁰ The 2008 report built on this foundation by calculating the returns on simultaneous investment in contraceptive services and maternal and newborn care, and showed how investing in the former can dramatically lower the costs of the latter.²¹ Next, two interim reports gave updated estimates on the need for and use of contraceptive services and maternal and newborn care in 2012.^{22,23}

This report takes a more comprehensive look at sexual and reproductive health by examining the benefits of investing in a constellation of services. It estimates the costs and direct health benefits of providing

- contraceptive methods and services to prevent unintended pregnancies (Chapter 2);
- pregnancy-related services and newborn care to reduce maternal and infant deaths and ill-health (Chapter 3);

Improving sexual and reproductive health and rights contributes to reducing poverty and achieving other development goals.

- services to prevent mother-to-child transmission of HIV and protect the health of HIV-positive pregnant women, as well as to treat other STIs among women of reproductive age (Chapter 4); and
- a combination of linked reproductive health services for women (Chapter 5).

For each area, data are presented for developing regions as a whole,* for geographic regions and for groups of countries by level of income. The report also examines service needs and gaps among sub-groups, such as the poor and the young, using data from countries with recent national surveys. Chapter 4 also contains a summary of low-cost ways to prevent cervical cancer, which is caused by a common STI, and Chapter 5 contains a discussion of the sexual and reproductive health needs of adolescents.

For each of the broad groupings of sexual and reproductive health services covered in Chapters 2–4, the report will present

- needs for these services among women of reproductive age and their newborns;
- the current levels of services they receive;
- the costs of current services and of fulfilling the unmet need for services; and
- health benefits that accrue from current services and that would accrue from meeting 100% of service needs.

Chapter 5 presents the costs and benefits resulting from fully meeting the need for both modern contraception and maternal and newborn health care, along with selected services for HIV and other STIs.

Beyond the direct and short-term health benefits quantified in the report, individuals, families and societies reap innumerable long-term gains from the ability to plan pregnancies and ensure healthy births. Chapter 5 briefly describes these gains, and Chapter 6 examines the efforts that will be needed to make the service goals a reality.

The Data and Methods Appendix (page 42) contains information on the methodologies behind the estimates provided throughout the report. Further details on data sources and methodologies used, as well as tables providing data on key indicators, are available online:

www.guttmacher.org/pubs/AddingItUp2014-appendix-tables.pdf

www.guttmacher.org/pubs/AddingItUp2014-methodology.pdf

*Per UN Population Division classifications, developing regions comprise all of Latin America and the Caribbean, Africa and Asia, excluding Australia, Japan and New Zealand. *Source:* reference 24.

2 Meeting the Need for Modern Contraceptive Services

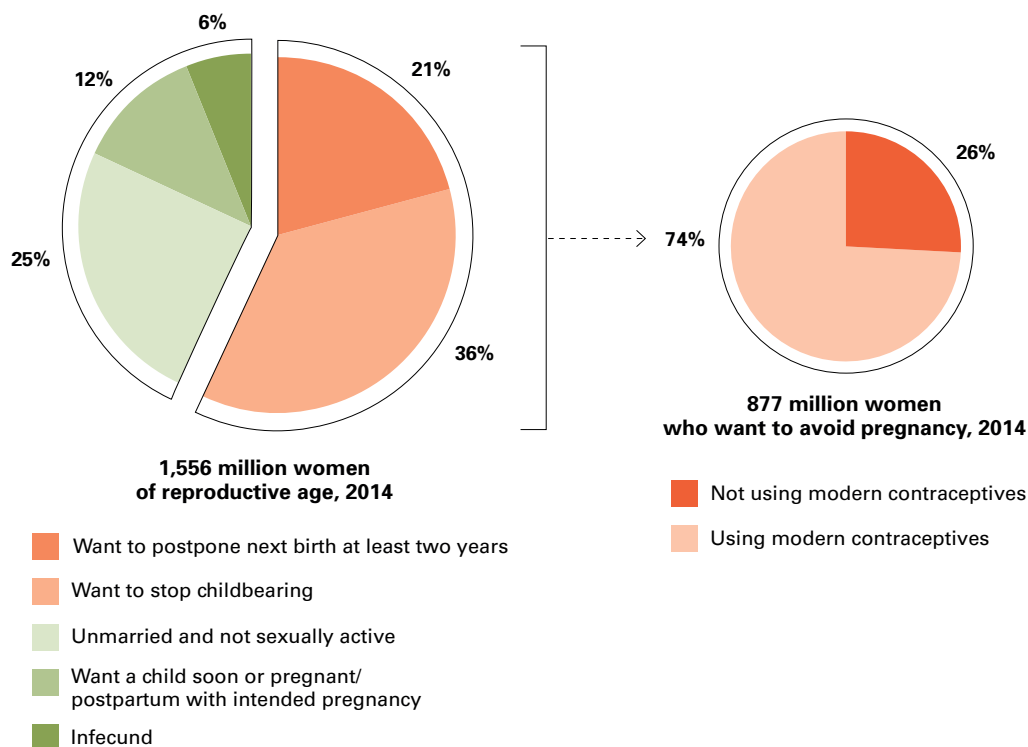
The shift from larger to smaller families in many countries represents one of the most important transformations in developing regions in recent decades and is made possible in large part by the availability of modern contraception. The use of modern contraceptive methods has risen greatly, from negligible levels 50 years ago to a prevalence of 57% among married women aged 15–49 in these regions in 2014.^{25–27} Contraceptive services, whether delivered through public-sector family planning programs, nongovernmental organizations, or private-sector clinics and pharmacies, have enabled millions of women and couples around the world to choose when to have children and how many to have.²⁸

Yet modern contraceptive use varies widely in developing regions. For instance, 88% of married women aged 15–49 use a modern method in Eastern Asia—while only 19% do so in Sub-Saharan Africa.²⁵ In some of the poorest countries, the quality and reach of services remain weak while the desire for smaller families is increasing.²⁶ In addition, rising levels of sexual activity among young, unmarried women²⁹—in part due to rising age at marriage³⁰—point to a growing need for contraceptives. This chapter presents information on the need for and use of modern contraceptives in 2014; the costs of current contraceptive services and of satisfying unmet need for modern contraceptives; and the direct health benefits that would result from meeting all of this need.

FIGURE

2.1 In developing regions, more than half of reproductive-age women want to avoid a pregnancy...

...but one-fourth of these women are not using effective contraceptives.



● FIGURE 2.1 Source: reference 25.

More than half of reproductive-age women need contraception

While the large majority of women are sexually active for much of their adult lives, most want only a few children. In developing regions in 2013, women had a lifetime average of 2.6 births; this figure ranged from 1.5 in Eastern Asia (predominantly China) to 5.2 in Sub-Saharan Africa.³¹ Even women at the upper end of this range spend most of their reproductive years wanting to avoid a pregnancy and therefore needing effective contraceptive methods.

Of the 1.6 billion women of reproductive age living in developing regions in 2014, more than half—877 million women—want to avoid a pregnancy and thus require effective contraception (Figure 2.1 and Box 2.1).²⁵ Most of these women (652 million) are using modern contraceptives, but 225 million are not. The latter group is defined in this report as having an unmet need for modern contraception.

BOX

2.1 Defining the Need for Modern Contraception

In this report, **women wanting to avoid a pregnancy** are women aged 15–49 who

- are currently using a contraceptive method, either traditional or modern;
- are currently married or are unmarried and sexually active (i.e., have had sex in the past three months), are able to become pregnant, but do not want a child in the next two years or at all;
- identify their current pregnancy as unintended; or
- are experiencing postpartum amenorrhea after an unintended pregnancy.

The last two groups of women are included because their current or recent experience with unintended pregnancy indicates that they wanted to avoid becoming pregnant at some point in the last year. They therefore help to complete the picture of the total number of women wanting to avoid pregnancy in any given year.

Women with unmet need for modern contraception are those who want to avoid a pregnancy but are currently using no method or a traditional contraceptive method.¹ Other studies may not define women using traditional methods as having unmet need. However, this report focuses on the need for *modern* methods because women using less effective, traditional methods face a higher risk of unintended pregnancy than those using modern methods.^{2,3} Because methods for calculating unmet need for contraception have recently been revised, our earlier estimates were updated to be comparable to new estimates for 2014 (see Appendix, page 42).

Modern contraceptive methods include hormonal implants, IUDs, female and male sterilization (all among the most effective methods);⁴ hormonal pills and injectables, male and female condoms and other supply methods; and modern methods of periodic abstinence (the Standard Days Method and TwoDay Method). **Traditional methods** include other periodic abstinence methods, the lactational amenorrhea method (which involves exclusive breast-feeding for up to six months postpartum), withdrawal and folk methods.

Another 679 million women do not currently need contraception, because they are unmarried and not sexually active, are not able to become pregnant, have recently had a planned birth, are experiencing an intended pregnancy, or want to have a child in the next two years.

The number of women wanting to avoid a pregnancy, and therefore needing modern contraceptives, has increased substantially in the developing world over the last decade, from 720 million in 2003 to 877 million in 2014.^{1,25} Three-fourths of the increase is due to population growth, and the remainder is due to increases in women's desire to avoid pregnancy. The number of women using modern contraceptives rose during that period, from 510 million to 652 million, and the proportion of women wanting to avoid pregnancy who are using modern contraceptives—that is, women whose demand for contraceptives is met—rose from 71% to 74% from 2003 to 2014.

Recent gains in some countries, such as in Ethiopia, Madagascar, Malawi and Rwanda, have been striking, reflecting high-level commitment and organized efforts to strengthen family planning services.³²

The gains are due in part to innovative financing strategies, such as insurance programs and performance-based funding of services.³³ In other countries, such as Mozambique, Nepal, Pakistan and Zimbabwe, the use of modern methods has increased relatively slowly or not at all in recent years.³⁴ And in most countries in Western and Middle Africa, modern contraceptive use remains rare.²⁵

Unmet need for modern contraception persists, particularly among the poor

Despite increases in contraceptive use in developing countries, the total number of women with unmet need remains high and has even increased slightly, from 210 million in 2003 to 225 million in 2014.^{25,35} This number has remained virtually unchanged since 2008. Unmet need for modern contraception among women who want to avoid pregnancy exists worldwide, but is concentrated among certain regions and groups of women.

- Unmet need is generally higher among women in the poorest households (Figure 2.2),²⁵ those with less education and those living in rural areas, compared with wealthier, better-educated and urban-dwelling women.
- It is higher among married women aged 15–19 than among married women aged 20 and older.
- It is higher in poorer regions than wealthier

regions and is particularly concentrated in Sub-Saharan Africa and Southern Asia.

- It is also disproportionately high in low-income countries:* About three-quarters of women with unmet need live in low- and lower-middle-income countries, while 56% of all women in developing regions live in these countries.²⁵

Among regions, Sub-Saharan Africa has the highest proportion of women in need of contraception who are not using modern methods (58%), while Southern Asia has the largest absolute number of these women.²⁵ Together, these two regions account for 61% of women with unmet need in developing regions. Unmet need for modern methods is high among almost all population subgroups in these regions, whether they are urban or rural, less educated or more educated, poorer or better off. Yet in all regions, young and unmarried women who need contraceptive services face greater barriers in accessing them than do older, married women. The special needs of young people are discussed in more detail in Chapter 5 (see Box 5.1, page 35).

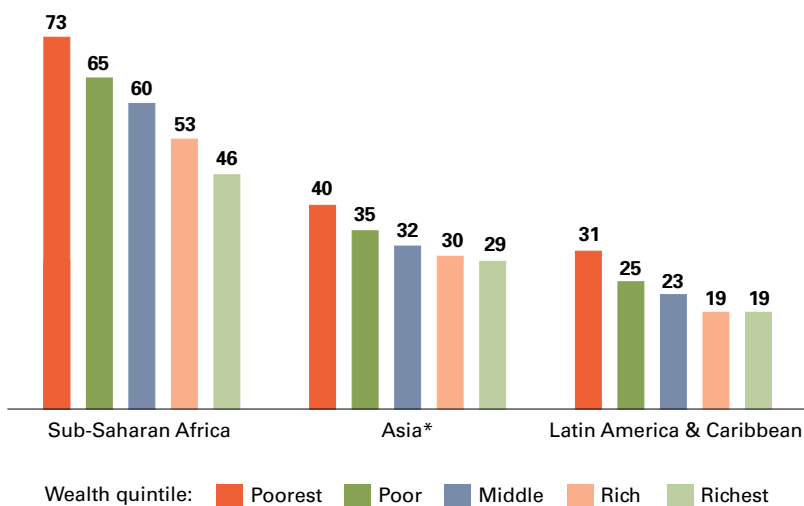
Unmet need for modern contraception is almost twice as high among women who want to postpone (or space) births as among those who want no more children—36% vs. 20%²⁵—suggesting a need for improved contraceptive services, including better contraceptive choices, for women who want to space their births. Women’s desires to postpone or stop childbearing influence their choices of contraceptive methods: Those wishing to delay a birth tend to use short-acting, reversible methods such as pills, injectables and condoms, while those wanting to have no more children are more likely to use one of the most effective methods—sterilization or a long-acting reversible method, such as an IUD. However, women who want to postpone births can also use long-acting reversible methods. These methods, which do not depend on users’ actions, are ranked by WHO as more effective for preventing unintended pregnancies than user-dependent methods, such as pills and condoms.³⁷

The motivations and circumstances that affect contraceptive use are wide-ranging and change over the course of women’s reproductive lives. Service providers should therefore offer all women a range of contraceptive options and a continuous supply of their chosen methods, along with counseling to help them understand their method options, select those that best fit their current needs and life situations, and use them consistently and correctly. In addition,

FIGURE

2.2 In developing regions, levels of unmet need for modern contraception are highest among the poorest women.

% of women wanting to avoid pregnancy who have an unmet need



strategies such as switching methods, dual method use and emergency contraception use are important ways of matching contraception to women’s and men’s particular needs and situations.³⁸ Over the long term, research programs must continue to develop and adapt methods to suit couples’ and women’s need for contraceptives that are effective and easy to use.³⁹ For instance, research is underway to develop a “pericoital pill,” an oral contraceptive that women could take within 24 hours before or after intercourse, rather than every day.⁴⁰

Increasing the use of modern methods will require addressing a range of barriers

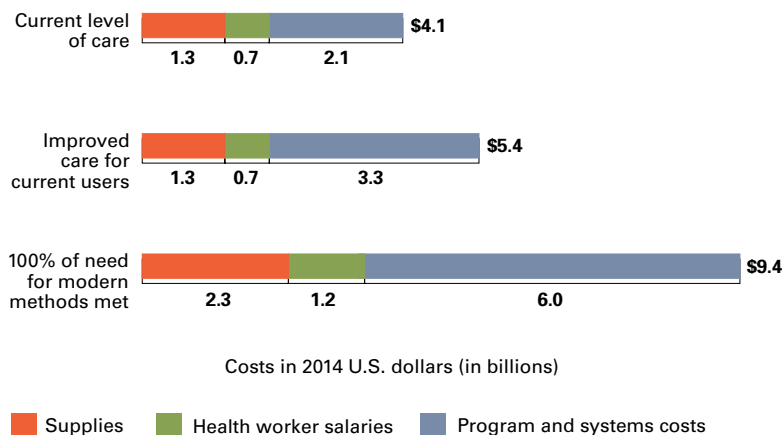
Reports on contraceptive use commonly say that women have unmet need because they lack access to supplies and services, but that is only one of the many reasons women report for not using contraceptives.⁴¹ When they are asked why they do not use contraceptives, women most frequently respond with concerns about their health or the side effects of methods, the belief that they are not likely to become pregnant, and their (or their families’) opposition to contraception.⁴² These concerns are similar across developing regions. Also, some current users of modern methods may use them inconsistently or discontinue use because they are having problems with their methods or with getting supplies, or because of changes in their relationship status.^{22,39}

● **NOTES TO FIGURE 2.2**
 Estimates apply to women aged 15–49 for 2014.
 *Includes Western, Central, Southern and Southeastern Asia; excludes Eastern Asia, which is predominantly China, and Oceania, due to lack of data on income differentials. Source: reference 25.

*Low-income countries are those with a 2012 gross national income (GNI) per capita of less than \$1,035, lower-middle-income countries have a GNI per capita of \$1,036–4,085, upper-middle- and high-income countries have a GNI per capita of \$4,086 or more. Source: reference 36.

FIGURE

2.3 Meeting all women's needs for modern contraceptives will cost \$5.3 billion per year more than is currently spent.



NOTES TO FIGURE 2.3
 Estimates are for 2014 for all developing countries. Program and systems costs include service-related program management, supervision and training of personnel, monitoring and evaluation, advocacy and public education, information and commodity supply systems, and the maintenance and expansion of the physical capacity of health facilities. Numbers may not add up to totals because of rounding. *Source:* reference 25.

Some barriers to using contraceptives are related to factors outside the health system, such as women's lack of education or empowerment, which stem from discrimination and gender inequality in society. Thus, efforts to advance women's status and rights are essential, although they are outside the scope of the analysis in this report. High-quality services can play a vital role in helping women overcome some of the personal and cultural barriers by providing care that respects and protects their rights to voluntary and informed contraceptive choice. These improvements would be consistent with fulfilling women's human rights and would make modern contraceptive services and use more acceptable to many women and couples (Box 2.2). Estimates of the costs associated with expanding services and improving their quality are described below.

Contraceptive services in the developing world currently cost \$4.1 billion annually

This section presents the current costs of modern contraceptive services, as well as the costs of improving services for current users and of providing quality services to all women who need them. There is international consensus that individuals and couples should have informed and voluntary choice in using contraceptives and choosing the most appropriate methods for their circumstances. The scenarios presented here on women's use of methods (based on the method mix among current users) are not meant to be prescriptive, but rather to show the potential impacts of these choices.

The current cost of modern contraceptive services for 652 million users in the developing world in 2014 is

an estimated \$4.1 billion (Figure 2.3).²⁵ This estimate includes the costs of contraceptives and related supplies (\$1.3 billion), health worker salaries (\$0.7 billion) and program and systems costs (also called indirect costs, \$2.1 billion). The indirect costs include many types of program support, such as staff supervision and training, information and education on family planning, construction and maintenance of facilities, development and maintenance of commodity supply systems, and other management functions.

The cost of contraceptives and related supplies varies by method: Long-acting and permanent methods such as the IUD and sterilization incur higher costs up front than short-acting methods, but they offer protection from pregnancy for many years. Thus, for each user, average annual direct costs are lowest for IUDs (\$0.58), male sterilization (\$0.88) and female sterilization (\$1.84). Annual costs per user are substantially higher for condoms (\$4.07) and are highest for hormonal methods (\$7.51–7.90).

The average annual cost per current user in the developing world in 2014 is \$3.18 in direct costs and a total of \$6.35 when indirect costs are factored in. These costs vary widely by region: The average total cost per user is lowest in Asia (\$4.76), where more than half of users are located; it is \$10.65 in Africa and \$13.44 in Latin America and the Caribbean.

These differences are due to variations in method costs, the mix of methods used and indirect costs. Costs are lowest in Asia, primarily because of the high prevalence of female sterilization and IUD use, especially in India and China. The costs of commodities and personnel are generally higher in Latin America and the Caribbean than in other regions, but costs are also high in Sub-Saharan Africa, where a higher proportion of women use hormonal methods, compared with other regions.

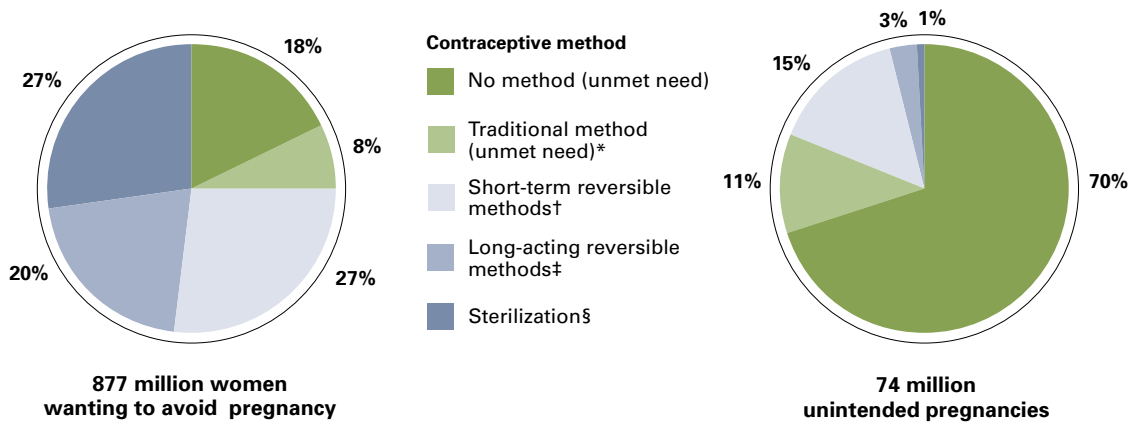
Providing modern contraceptives to all women who need them requires more than a doubling of spending

Investments in the programs and systems that support services will be essential if all women who need modern contraceptives are going to overcome the barriers they face in obtaining them and using them effectively. Areas in which improvements are needed include provision of accurate information and education, provision of a range of modern methods, logistics to ensure a continuous flow of supplies, training for health workers, availability and adequacy of service sites, supply of community-based workers, and availability of counseling on methods and

†All cost estimates in this report represent one-year costs in 2014 U.S. dollars.

FIGURE

2.4 Women with unmet need for modern contraception make up 26% of those who want to avoid a pregnancy, but account for 81% of unintended pregnancies.



● **NOTES TO FIGURE 2.4**
 Estimates are for 2014 for all developing regions.
 *Traditional periodic abstinence, lactational amenorrhea method, withdrawal and folk methods. †Hormonal pills, injectables, condoms and other barrier methods, spermicides and modern periodic abstinence methods (Standard Days and TwoDay). ‡IUDs and implants. §Female or male. Source: reference 25.

follow-up of users. These upgrades are most urgently needed in countries where unmet need is highest, especially in Sub-Saharan Africa.

If services were improved for the 652 million women currently using contraceptives, costs would increase to \$5.4 billion annually (\$2.1 billion in direct costs and \$3.3 billion in indirect costs; Figure 2.3).²⁵ If the 225 million women with unmet need were to use the same mix of methods as current modern method users and receive improved services, total costs would increase to \$9.4 billion annually (\$3.4 billion in direct costs, plus \$6.0 billion in indirect costs).

The \$5.3 billion difference between the cost of serving current users and the cost of meeting all need for modern contraception reflects the magnitude of the improvements required to expand capacity and improve the quality of contraceptive services. An important factor underlying the cost increase is the concentration of unmet need in Africa and in low-income countries in other regions. Program and systems costs are particularly high because the need to strengthen health systems is greatest in these parts of the world.

With all unmet needs satisfied and the quality of contraceptive care improved, the average annual cost per user would increase (primarily due to a rise in indirect costs) from \$6.35 to \$10.77. These estimates assume that all women with unmet need would use modern contraceptives, and that new users would use the same mix of methods as current modern method users in the same country with the same

BOX

2.2 Quality Health Care and Human Rights

Health and human rights are intertwined: Lack of care, inadequate care, and disrespectful or abusive treatment violate internationally recognized human rights and are also public health concerns. Conversely, high-quality care contributes greatly to fulfilling people’s basic right to good health. Global efforts to improve sexual and reproductive health have long emphasized the connection between human rights and health services and have worked to ensure that services and service providers respect, protect and fulfill basic rights, such as privacy, dignity, freedom of choice and freedom from harm. In recent years, human rights issues have received renewed attention. The FP2020 initiative promotes a “human rights-based” approach to improving the quality of contraceptive services, and frameworks and guidelines have been developed to elaborate on what this means in practice.^{1–5} Guidelines call for services to be

- available (at adequate, equitably distributed service locations);
- accessible (affordable, not too distant, reachable by transportation, free of discrimination and available through a variety of service models);
- acceptable (respectful of medical ethics, cultural values and clients’ views);
- accountable (addressing any violation of rights or omission of critical services);
- highest quality (technically competent and client-focused); and
- participatory (involving women and communities in the programs and decisions that affect them).

Though these guidelines are written specifically for contraceptive services, these human rights principles also apply to the whole the spectrum of reproductive, maternal, newborn and STI care.

TABLE

2.1 Unintended pregnancies, deaths and DALYs averted annually in developing regions by current contraceptive services and by fully meeting the need for modern methods

MEASURE	CURRENT LEVEL OF CARE (000s)	100% OF NEED FOR MODERN METHODS MET (000s)
Unintended pregnancies averted	231,000	283,000
Unplanned births	61,000	82,000
Safe abortions	106,000	116,000
Unsafe abortions	38,000	52,000
Miscarriages*	25,000	31,000
Stillbirths†	1,600	2,200
Deaths averted	1,200	1,800
Maternal	100	170
Newborn (aged <1 month)	1,100	1,600
DALYs averted	104,000	156,000
Maternal	7,000	12,000
Newborn (aged <1 month)	97,000	144,000
No. of contraceptive users	652,000	225,000

Notes: Estimates are for 2014 for all developing countries. Numbers may not add up to totals because of rounding.*Fetal deaths before 28 weeks' gestation. †Fetal deaths at or after 28 weeks' gestation. Source: reference 25.

marital status and childbearing plans. These assumptions are made with the expectation that women's individual choices are affected by the strengths and limitations of services within their countries, but these choices are also shaped by women's personal situations. If fewer women adopted a modern method, then both the costs and the benefits of contraception would be reduced. If, on the other hand, women were able to choose more effective contraceptive methods and were supported in using their chosen methods more consistently and correctly, then the benefits could be greater than those presented here.

Increased use of modern contraceptives would save lives and improve health

An estimated 74 million unintended pregnancies occur each year in the developing world, either because women do not use contraceptives or because their method fails. Because the chance of pregnancy is higher when women do not use contraception, 70% of unintended pregnancies occur among the 18% of women who want to avoid a pregnancy and are not using a method (Figure 2.4).²⁵ An additional 11% of unintended pregnancies occur among the 8% of women who are using traditional contraceptive methods, whereas only 19% of unintended pregnancies occur among the 74% who use modern methods. Each year in developing regions, unintended pregnancies result in an estimated 28 million unplanned births, 36 million abortions (20

‡Unsafe abortions are defined as those performed by individuals lacking the requisite skills or in environments below minimum medical standards, or both.

million of which are unsafe^{‡43}), eight million miscarriages and 0.8 million stillbirths.

Currently in 2014, 652 million women use modern contraceptives, thus preventing 231 million unintended pregnancies, of which 144 million would have ended in abortion (106 million safe and 38 million unsafe; Table 2.1). In addition, it averts 1.6 million stillbirths, 1.1 million newborn deaths, 100,000 maternal deaths and other poor health outcomes for infants and mothers^{44,45} that would have occurred in the absence of any modern method use. Disability-adjusted life years (DALYs) averted—a measure of death and disability prevented or avoided (Box 2.3)—total 104 million (seven million for women and 97 million for newborns).²⁵ By preventing poor health outcomes, current spending on contraceptive services also reduces the need for other health services, such as treatment for complications of childbirth and unsafe abortion.

If all 225 million women with an unmet need for modern contraception were to receive services, unintended pregnancies would drop even further, by an additional 52 million per year. Compared with current levels of contraceptive use, this reduction in unintended pregnancies would lead to:

- 21 million fewer unplanned births;
- 24 million fewer abortions;
- six million fewer miscarriages; and
- 0.6 million fewer stillbirths.²⁵

The immediate health benefits of averting these unintended pregnancies would be substantial. Compared with the current situation, fulfilling unmet need would each year result in

- 70,000 fewer maternal deaths (18,000 fewer from unsafe abortion and 53,000 fewer from other complications of pregnancy and delivery);
- 500,000 fewer newborn deaths; and
- 52 million fewer healthy years of life lost, (4.7 million fewer DALYs among women and 47.7 million fewer among newborns).²⁵

Overall, the greatest gains accompany the greatest investments. The regions with the highest levels of unmet need for modern contraception—Sub-Saharan Africa and Southern Asia—would see the largest gains in health and well-being from satisfying unmet need.

Fulfilling unmet need is a cost-effective way to improve health

Meeting the need for modern contraception for all 877 million women in the developing world who want to avoid a pregnancy would cost, on average,

- \$11 per contraceptive user for a year of supplies and services;
- \$33 to prevent an unintended pregnancy;⁵
- \$5,400 to prevent the death of a woman or newborn; and
- \$61 to avert a DALY (women and newborns combined).

The cost per DALY averted compares favorably with other interventions to improve women's and children's health, and it is among the most highly cost-effective health interventions overall.⁴⁶ Furthermore, this rather conservative estimate reflects only the direct health impacts of contraception. Broader and longer-term health, social and economic benefits—to women, households and society—resulting from contraceptive use, are discussed in Chapter 5.

BOX

2.3 Using DALYs to Measure and Compare Health Outcomes

Disability-adjusted life years (DALYs) are a measure of the number of years of healthy life lost as a result of premature death and disability. One DALY equals one lost year of healthy life. The measure was developed to provide comparable estimates of the burdens of premature death and disability attributable to different causes around the world. Expressing diverse health outcomes in a common unit allows decision-makers to compare the impact of different health interventions.^{1,2}

In cost-effectiveness analyses, estimates are made of the number of years of disability-free life that would be gained from a particular health intervention, yielding a cost per DALY averted. For example, a global study in 2006 estimated that the cost per DALY averted with routine childhood vaccines (the Expanded Program on Immunization—a particularly high-impact and cost-effective program) ranged from \$7 in South Asia and Sub-Saharan Africa to \$438 in Europe and Central Asia.³ Voluntary testing and counseling for HIV cost \$14–261 per DALY averted, while antiretroviral treatment for HIV (assuming high adherence to drug regimens) was estimated at \$350–500 per DALY averted and is considered moderately cost-effective. High-cost interventions are those that approach the annual per capita income per DALY averted. In developing regions, these include the acute management of illnesses such as stroke, heart disease, tuberculosis and diarrheal disease, and home-care treatment for AIDS.

§Fully meeting women's needs for modern contraception would enable them to avoid three pregnancies for every 10 years of contraceptive use, compared with using no modern methods, on the basis of current patterns of marriage and sexual behavior, method mix and use-effectiveness rates.

3

Essential Health Services For Pregnant Women And Newborns

Worldwide, maternal and child deaths have declined dramatically in recent years. In some countries these deaths have dropped by more than half since 1990, with most of the gains occurring since 2000.² Still, an estimated 290,000 women worldwide die each year of causes related to pregnancy that could be prevented or better managed.⁴⁷ In addition, almost three million newborns die each year in the first month of life, accounting for 44% of all deaths among children younger than five.^{48,49} The vast majority of maternal and newborn deaths occur in Sub-Saharan Africa and Southern Asia—regions where health systems are weak and too few health care workers are trained and equipped to provide lifesaving interventions.

A range of essential services is necessary to protect and enhance women's health before, during and after a pregnancy. These services are also needed to give children a healthy start in life, and given that the health of a mother and of her newborn are closely intertwined, their care must be linked. Most maternal and newborn deaths are caused by the poor health of the mother before or during pregnancy, or by poor-quality care in the critical hours and days before and after a birth.⁵⁰ Poor health outcomes for mothers also have serious ramifications for families, including elevated death rates among infants and children whose mothers have died.^{51,52}

All pregnancies and births pose some health risks to the mother and infant that cannot necessarily be predicted in advance. Therefore, a minimum level of care must be given to all pregnant women to promote safe and healthy outcomes. WHO has established standards of care for reproductive-age women and their infants—before and during pregnancy, during childbirth and after birth—which this report uses to gauge the adequacy of care women and newborns receive and to estimate the costs of fulfilling unmet needs.^{53–56}

In developing regions each year, an estimated 125 million pregnancies—66% of the total 190 million pregnancies—result in a live birth (Figure 3.1).²⁵ The other 65 million pregnancies result in miscarriages, stillbirths or induced abortions. Ideally, all pregnant women should obtain routine care, whether their pregnancy is intended or not, and those who need more specialized medical services because of their individual risks or because of emergency situations should obtain these services without delay.

The following services for pregnant women and their newborns are covered in this chapter:

- Antenatal care with a skilled provider
- Delivery in a health facility, including routine care for the mother and newborn
- Postnatal care for the mother and newborn, including routine checkups and support for breast-feeding
- Care for medical complications that arise during pregnancy, childbirth and shortly after birth for the woman and her newborn
- Care for women who experience a miscarriage or stillbirth or who obtain an abortion

The next section focuses on women having live births and the adequacy of the care they receive. Women whose pregnancies do not result in live births are discussed separately, on pages 19–22.

In the poorest countries, fewer than half of pregnant women receive adequate antenatal care

Good quality antenatal care offers women the information, counseling and services they need to have a healthy pregnancy—including screening, preventive care and treatment for a range of conditions, such as hypertension, malaria, syphilis and anemia, that could jeopardize the health of the woman or her baby. WHO recommends a minimum of four antenatal visits with a skilled professional—a midwife, nurse or doctor—beginning in the first trimester (12 weeks) and continuing throughout the pregnancy.⁵³

An estimated 290,000 women worldwide die each year of causes related to pregnancy that could be prevented or better managed.

Just over half (57%) of pregnant women in developing regions make the recommended four or more antenatal visits (Table 3.1).²⁵ Improvement has been slow since 2008, when 51% made four or more antenatal visits.²³ In low-income countries, only 39% of pregnant women make the recommended number of visits, compared with 82% of those in upper-middle- and high-income developing countries. There are also wide disparities in care among subregions: Only 35–37% of pregnant women in Eastern Africa and Southern Asia make the recommended minimum number of visits, while 80% or more do so in Southern Africa, Eastern Asia, and Latin America and the Caribbean.

Even when women make antenatal visits, they do not necessarily receive all of the services they need. For example, among the women who receive any antenatal care, just over two-thirds receive a urine test during their pregnancy, as recommended by WHO.^{25,53} In upper-middle- and high-income developing countries, almost 90% of pregnant women receive a urine test, while in low- and lower-middle-income countries, 51–64% of women do. Antenatal care should also provide pregnant women with screening and treatment (or a referral for treatment) for HIV and other STIs (Chapter 4), but most women who need these services are not receiving them. These data indicate that much work is needed to bring antenatal care up to recommended standards.

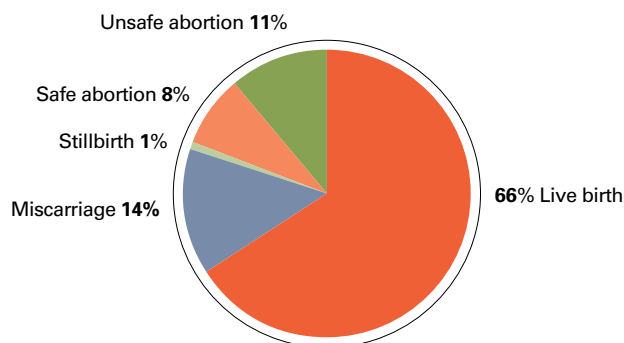
Access to emergency medical care at delivery is crucial for saving lives

Because the vast majority of maternal and newborn deaths occur around the time of delivery, skilled care at birth and access to emergency obstetric care are critical for saving lives.^{57–59} While women and their babies benefit from having skilled assistance at home, they also need access to treatment for delivery complications when they arise and to postnatal care in the critical hours and days after birth. The major complications of pregnancy—hemorrhage (severe bleeding), sepsis (infection), hypertension, prolonged or obstructed labor, and complications of unsafe abortion—can lead to serious illness, injury and even death if left untreated.^{60,61} Women who deliver in a health facility have a better chance than those delivering at home to receive skilled care for routine deliveries; for obstetric complications, should they arise; and for routine and urgent care for their newborns.²³

Across the developing world, two-thirds of women deliver their babies in a health facility (Table 3.1).²⁵ But levels among subregions range from lows of

FIGURE

3.1 Each year in developing regions, 125 million pregnancies result in live births.



190 million pregnancies, 2014

42% in Eastern Africa, 47% in Western Africa and 53% in Southern Asia to highs of 90% or more in Eastern Asia, Central Asia and South America. The proportion of women with skilled assistance at birth—an indicator commonly used to measure progress toward reducing maternal deaths—follows a similar pattern, and the levels of facility-based deliveries and skilled assistance at birth are very close for most regions and subregions (see Web Appendix Tables at www.guttmacher.org/pubs/AddingItUp2014-appendix-tables).²³

In all regions, steady progress can be seen in the proportions of women delivering in facilities: From 2008 to 2014, the proportion increased from 55% to 66% for the developing world as a whole.^{21,25} The gains in facility-based deliveries are greater than those seen in the proportions of women making the minimum number of antenatal visits. Every subregion recorded progress in facility-based deliveries since 2008, including in Sub-Saharan Africa, where the gains averaged about one percentage point per year between 2008 and 2014, increasing from 42% to 48%.^{23,25}

Gains in the proportions of women delivering in facilities have been achieved in diverse countries. Rwanda strengthened its health system and dramatically increased access to a range of health services, including contraceptive, antenatal and delivery care in the period since 2005.⁶² In India, the proportion of births occurring in health facilities increased substantially after 2005, largely because of a program offering cash incentives to women who deliver in facilities and to the community health workers who help bring them into care.⁶³ Certain Latin American countries, such as Colombia and the Dominican

FIGURE 3.1 Source: reference 25.

TABLE

3.1 Number of women giving birth in developing regions and proportion receiving specific types of maternal health care, by region and country income level, 2014*

REGION OR INCOME LEVEL	NO. (000s)	% WITH AT LEAST 4 ANTENATAL CARE VISITS	% DELIVERING IN A HEALTH FACILITY	% WITH A CESAREAN-SECTION DELIVERY
All developing regions	125,040	57	66	17
Africa	40,020	47	51	6
Sub-Saharan Africa†	36,130	46	48	5
Eastern Africa	14,110	37	42	4
Middle Africa	5,800	46	62	6
Southern Africa	1,290	85	87	19
Western Africa	13,630	50	47	3
Northern Africa	5,180	59	64	15
Asia‡	74,090	58	70	20
Eastern Asia	19,200	85	99	39
Central Asia	1,480	77	95	8
Southern Asia	36,580	35	53	12
Southeastern Asia	11,240	79	69	14
Western Asia	5,310	69	79	22
Latin America and the Caribbean	10,930	88	91	37
Caribbean	730	84	77	27
Central America	3,350	84	86	35
South America	6,850	90	94	39
Country income levels§				
Upper-middle and high	38,510	82	95	35
Lower-middle	58,330	50	56	10
Low	28,200	39	46	6

Notes: Numbers may not add up to totals because of rounding. *Based on births in 2014 and women's care during pregnancy for the last birth in the last two or three years (depending on the survey). †Includes Eastern, Middle, Southern and Western Africa, as well as Sudan, which is in Northern Africa. ‡Includes Oceania, which is not shown separately. §Using World Bank classifications: Low income corresponds to a 2012 GNI per capita of <\$1,035, lower-middle to \$1,036–4,085 and upper-middle and high-income to >\$4,085. Source: reference 25.

Republic, have made consistent gains and have almost reached the goal of having all women deliver in health facilities.²⁵

Within countries, the poorest women are much less likely to deliver in a health facility than their better-off peers. The disparities are widest in Sub-Saharan Africa and Asia (excluding Eastern Asia and Oceania), regions where smaller proportions deliver in facilities, and they are narrower in Latin America, where institutional deliveries have been the norm for some time (Figure 3.2).²⁵

Access to facility-based care gives women a better chance of receiving lifesaving procedures such as the cesarean section, which is needed when a baby cannot pass through the birth canal. However, while the procedure can save the lives of women and their newborns, it should not be necessary for more than

10–15% of births.^{64,65} Higher cesarean rates do not appear to contribute additional health benefits, and may in fact indicate undue health risks for mothers having the procedure and their newborns. Cesarean sections tend to be underused in poor countries and overused in better-off countries. Cesarean-section deliveries are most common (and well beyond recommended levels) in Latin America and the Caribbean, Southern Africa, Eastern Asia and Western Asia, and they are least common in Eastern, Middle and Western Africa where only 3–6% of deliveries are by cesarean section (Table 3.1).²⁵

The majority of women experiencing obstetric complications do not receive the care they need

Only a minority of women (24%) experience major complications during pregnancy, delivery or the immediate postpartum period, such as hemorrhage, sepsis, hypertension or obstructed labor, yet 69% of these women do not receive the medical care they need.²⁵ Some women do not receive care because they do not deliver in a health facility; others deliver in a facility that does not provide the necessary care.

Mothers and newborns also need postnatal care to address routine and emergency health needs in the hours and days after a birth. Postnatal care, especially within the first 48 hours after birth, is critical for managing sepsis, one of the leading causes of maternal deaths in developing countries, and for ensuring the health of the newborn. Demographic and Health Surveys show that in most countries, about 75% of women who deliver in facilities report receiving a health checkup within about 48 hours after delivery, compared with only about a quarter of other women.⁶⁶

Postnatal care should include contraceptive services, as well as health care for mothers and infants.

Extensive evidence from a broad base of surveys in many developing countries supports the case for spacing births at least two years apart: Overall, infants born at shorter intervals face a higher risk of death, and the risk is even greater if the mothers have had many children.⁴⁴ Birthspacing is also good for mothers, as women who become pregnant less than six months after a birth have been found to be at increased risk of pregnancy complications and maternal death and disability.⁴⁵

Newborn care falls far short of need

About three-quarters of newborn deaths occur in the first week of life and can be attributed to three main causes: sepsis and infection; complications of

preterm birth; and asphyxia (breathing difficulties) and birth trauma.^{49,67} Basic interventions to prevent these deaths, such as the following, are low-cost and simple to perform and should be integrated with maternal health care:^{54,68}

- Clean delivery and hygienic cord care
- Resuscitation with a bag and mask for babies who are unable to breathe
- Drying the baby and keeping it warm
- Support for breast-feeding in the first hour after birth
- Special care for low-birth-weight and preterm babies (such as skin-to-skin contact for warmth)

Globally, almost two-fifths of newborns have one of the three major complications, and a great many of them (69%) do not obtain the medical care they need.²⁵ Because recognition and care for such conditions are often linked to obtaining facility-based services, the proportion with unmet need for care for major complications is very similar among newborns and women giving birth.

Women whose pregnancies do not result in a live birth also need care

In any given year, some pregnancies—about one-third in 2014—are not carried to term.²⁵ Pregnant women may choose not to have a child, or a pregnancy may not end in a live birth because of complications during pregnancy or delivery. Yet, these women have health care needs that existing services could address more effectively.

The 65 million pregnancies in developing regions not ending in a live birth can be broken down as follows:

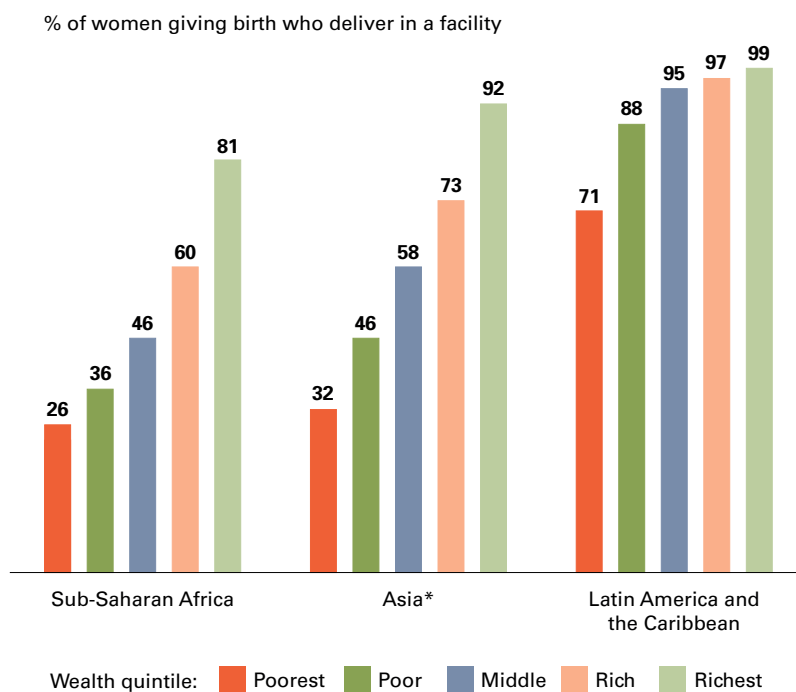
- 26 million miscarriages (fetal deaths before 28 weeks' gestation)
- 2.6 million stillbirths (fetal deaths at or after 28 weeks' gestation)
- 36 million induced abortions, of which 20 million are unsafe

WHO recommends that women who have miscarriages receive antenatal care up to the time of pregnancy loss, and in some cases, afterward.⁵⁴ Women with stillbirths (Box 3.1) should receive antenatal, delivery and postpartum care, while women who decide to terminate their pregnancies should receive safe abortion services, as well as treatment for complications of unsafe abortion, when necessary. And women who do not want to have a child soon need contraceptive services to help avoid a future unintended pregnancy.

Survey data are not available on the care these women receive, however. This analysis assumes that

FIGURE

3.2 Across developing regions, delivery in a health facility is lowest among the poorest women.



women who have stillbirths receive the same level of services as women in their countries who have live births, and that women who have miscarriages receive a similar level of antenatal care as those giving birth, taking into account gestation at the time of pregnancy loss.

For women undergoing an abortion, WHO recommends the least invasive (and thus most appropriate) abortion procedures depending on gestation—i.e., the number of weeks since the woman's last menstrual period.⁶⁹ Procedures include manual or electric vacuum aspiration, dilation and evacuation (D&E) or medication abortion (using the drugs mifepristone and misoprostol or misoprostol alone where mifepristone is not available). But because of legal and other restrictions on abortion in the large majority of developing countries, most poor women do not have access to safe and affordable abortion services. Even in countries where the procedure is legally permitted under some circumstances, women may face considerable obstacles to obtaining services, including lack of information about the process for getting a legal procedure, social stigma, a shortage of trained providers and providers' unwillingness to offer the services.⁷⁰⁻⁷²

● **NOTES TO FIGURE 3.2**
 Estimates are for 2014.
 *Includes Western, Central, Southern and Southeastern Asia; excludes Eastern Asia, which is predominantly China, and Oceania, due to lack of data. Source: reference 25.

*Immediate interventions such as these are included, but more complex, long-term care, such as neonatal intensive care and surgery for congenital abnormalities, is not included.

WHO also provides standards of care for addressing postabortion complications, such as hemorrhage or infection, which are most likely to occur where abortions are illegal and unsafe.⁶⁹ Of the estimated 20 million women obtaining unsafe abortions each year, about 40% have complications that require medical care in a facility, and only about three-fifths of these women obtain care.⁷² In addition to medical treatments for specific complications, WHO standards call for vacuum aspiration or treatment with misoprostol, rather than more invasive surgical methods, to be used for incomplete first trimester abortions and also recommend contraceptive counseling and services for all abortion patients.

BOX

3.1 Stillbirths: A Hidden Health Problem

An estimated 2.6 million stillbirths occur annually

Stillbirth, defined as the death of a fetus weighing at least 1,000 g (2.2 lbs) or one that occurs at or after 28 weeks' gestation, is a common yet nearly invisible problem.¹ Global incidence numbers are imprecise, as 99% of stillbirths occur in low- and middle-income countries, where the least information is available. Only a small minority of stillbirths are counted through vital registration; the estimates rely largely on surveys and statistical models.

The most recent global study estimated that there were 2.6 million stillbirths in 2009, down from an estimated 3.0 million in 1995.² However, while the worldwide stillbirth rate declined by 14% between 1995 and 2009, from 22 to 19 stillbirths per 1,000 total births, the rate of decline was slower than that associated with either maternal mortality or child mortality.

Most are due to preventable causes

Most stillbirths are avoidable, as evidenced by the low stillbirth rate of three per 1,000 births in developed countries, in contrast to 29 per 1,000 births in Sub-Saharan Africa.² Two-thirds of stillbirths globally occur in rural areas, where levels of professional care during pregnancy and delivery, including access to cesarean sections, are lower than in urban areas.

Almost half of stillbirths occur during labor and delivery, highlighting the magnitude of loss of life just hours and minutes prior to birth.³ Studies suggest that 25–62% of these stillbirths could be avoided with improved obstetric care and quicker responses to childbirth complications, including reducing delays in seeking care when complications occur during home deliveries.⁴

Infection is a leading cause of stillbirth, accounting for about half of all stillbirths in developing countries.⁵ Syphilis remains a major cause, although the disease is treatable and WHO recommends that all pregnant women be tested as part of routine antenatal care. Only 66% of women making antenatal care visits (54% of all women giving birth) are currently screened for syphilis.⁶ Malaria during pregnancy is another important preventable cause of stillbirth.⁵

Better tracking is an important step to improve outcomes

Better collection and use of data are critical for understanding and addressing the health burden due to stillbirth. Systematic collection in vital registration, in particular, is essential to measuring the scale of the problem and choosing the highest priority actions to include in efforts to improve maternal health.¹

Tens of millions of pregnant women and newborns have unmet need for maternal and newborn care

Despite progress made in recent decades toward making pregnancy safer, tens of millions of women in the developing world have an unmet need for maternal health care. Of the 125 million women giving birth each year,

- 54 million make fewer than the recommended minimum of four antenatal visits;
- 43 million do not deliver their babies in a facility;
- 21 million need but do not receive care for major obstetric complications; and
- 33 million have newborns who need but do not receive care for complications.²⁵

In addition, among the women whose pregnancies do not result in a live birth,

- 3.4 million with second-trimester miscarriages do not receive adequate care in a facility after the miscarriage;
- 1.2 million with stillbirths do not receive adequate delivery care; and
- 3.2 million are unable to obtain the necessary care after an unsafe abortion.

Why do so many women lack basic care during pregnancy and delivery? Much of the unmet need reflects a lack of access to and poor quality of maternal and newborn care, due to weak and underfunded health systems.^{73–75} Some women lack transport to health facilities, and some facilities are not equipped to provide the necessary care because they have too few trained providers or because the basic lifesaving drugs and supplies are not available.⁷⁶ Also, lower-level facilities may fail to transport women promptly to higher-level facilities that can provide the necessary care.

In addition, some unmet need is due to attitudes and beliefs that prevent women from seeking and using modern facilities for their deliveries. For example, in response to surveys, some women report that it is not customary or not necessary to deliver in a facility.⁶⁶ Apart from improving access, therefore, maternal and newborn health programs must address these beliefs by educating women, their partners and other family members about the health benefits of delivering their babies in health facilities or with skilled professionals.

Other studies and anecdotal evidence suggest that some providers' attitudes and behaviors may deter women from seeking maternal and newborn health care.⁷⁷ For example, women who go to facilities to

give birth may encounter disrespect or verbal or physical abuse. Or they may receive care that lacks dignity, confidentiality or informed consent.⁷⁸ These problems are systemic and persist for many reasons: Some providers lack basic awareness about patients' rights; some are stressed and overworked; societies may tolerate abusive behavior; and health care systems may lack accountability and oversight mechanisms.⁷⁹ A human rights–based approach to care would address many of these issues (Box 2.2, page 13). Solutions may include increasing the size of the health workforce, improving training for health professionals, and making greater use of midwives and other community health workers,⁸⁰ who, with the necessary training, can provide culturally sensitive and effective services.

Providing recommended maternal and newborn care for all would require more than a doubling of current costs

For women giving birth in 2014, the direct cost of providing maternal and newborn care is \$5.9 billion. Supplies account for 36% of direct costs, and health worker salaries account for 64%.²⁵ Indirect (program and systems) costs for the current level of services are an estimated \$5.8 billion, bringing total current costs to \$11.7 billion (Figure 3.3).

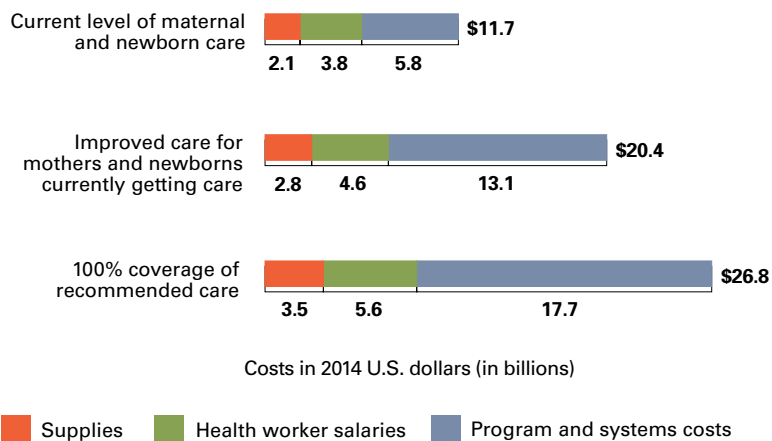
The average direct cost per woman giving birth in the developing world is currently \$47—\$9 for antenatal care and \$38 for delivery and newborn care (not shown). Compared with the average direct cost in Africa (\$33) and Asia (\$45), costs are substantially higher in Latin America and the Caribbean (\$111), largely because more women receive care and the care they receive is more comprehensive. If women received WHO-recommended care, average direct costs per woman giving birth would rise to \$73—\$15 for antenatal care and \$58 for delivery and newborn care.

Providing improved maternal and newborn care for women who currently receive care that is inadequate (thus meeting the standards recommended by WHO) would cost \$20.4 billion. Meeting all needs requires providing current users more comprehensive care, as well as providing the recommended care to those who are not currently using any services. Providing the recommended level of maternal and newborn care to all women who give birth each year in developing regions would cost an estimated \$26.8 billion, more than a doubling of current costs.

Of the \$26.8 billion total, direct costs account for \$9.1 billion and indirect costs for \$17.7 billion. The

FIGURE

3.3 Providing the recommended care to all mothers and newborns in developing regions will require \$15 billion more per year than is currently spent.



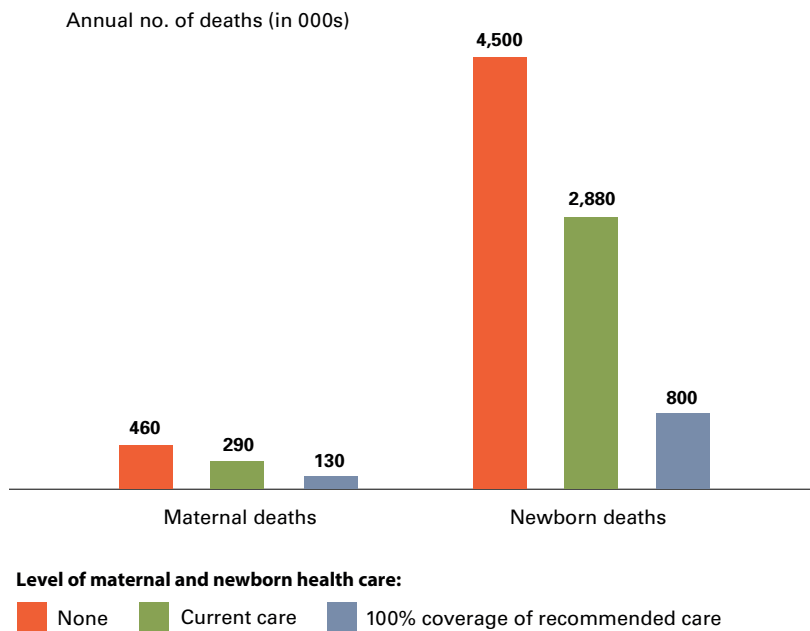
increase in indirect costs is greater than the increase in direct costs because it is not possible to simply add more users to existing services: Service capacity must expand to serve all pregnant women. Part of the increase in indirect costs reflects onetime investments to increase the capacity of health facilities, and part reflects ongoing activities such as management, training and information systems. Over the long term, once systems are expanded and strengthened, this component of indirect costs would likely decline.

Preventing an unintended pregnancy through use of modern contraception is much cheaper than the cost of care for an unplanned birth: The average cost of contraceptive services to avert an unintended pregnancy is an estimated \$33, compared with an average of \$239 for antenatal, delivery and newborn care for an unintended birth (these are total cost estimates for fully meeting WHO recommended standards of care).²⁵

Funds for current services come from a variety of sources, including the women and families themselves, governments and donor agencies. Discussions about the needed funds, however, must take into account that the people most in need of services are among the least able to pay (Chapter 6). Low- and lower-middle–income countries account for 82% (\$12.3 billion out of \$15.1 billion) of the increase in spending needed to fully meet all unmet needs for maternal and newborn care. Latin America accounts for 5% of the total increase in costs, while Africa (where health systems are in greatest need of

NOTES TO FIGURE 3.3
Estimates apply to live births only and are for 2014 for all developing countries. Program and systems costs include service-related program management, supervision and training of personnel, monitoring and evaluation, advocacy and public education, information and commodity supply systems, and maintenance and expansion of the physical capacity of health facilities. Numbers may not add up to totals because of rounding. Source: reference 25.

3.4 Expanding maternal and newborn health care would mean fewer deaths.



NOTES TO FIGURE 3.4

Estimates are for 2014 for all developing regions. Maternal deaths include those related to all pregnancy outcomes. In all three scenarios, contraceptive use is at current levels. *Source:* reference 25.

strengthening) accounts for 69%; Asia accounts for the remaining 25%.

Additional funds are needed to care for women whose pregnancies do not result in a live birth

Women whose pregnancies do not end in live births also need services, and these are not included in the cost estimates above. The current cost of medical care for women who have miscarriages and stillbirths is \$527 million (not shown).²⁵ If all of these women were to receive the recommended antenatal care, delivery care (in the case of stillbirths) and care for medical complications, the cost would rise to \$2.2 billion.

While the costs of induced abortions are difficult to measure, the current cost of abortion procedures in the developing world is an estimated \$562 million—\$271 million for safe abortions and \$291 million for those obtained under unsafe conditions. If all abortions in developing regions that are currently unsafe were provided safely, the total cost of services for all 36 million abortions would be an estimated \$833 million. Increased provision of safe abortion services would reduce maternal deaths and nearly eliminate the cost of treating postabortion complications.

The current cost of providing postabortion care in the developing world in 2014 is an estimated \$232 million. If all women who need postabortion care

were to receive it, the total cost would increase to \$562 million, but if abortions all occurred under safe conditions, the cost would be only \$20 million.

Women, families and health systems bear a substantial proportion of the costs of unsafe abortion when women need medical care due to hemorrhage, infection or other serious conditions following dangerous procedures. A study in Uganda, where abortion is highly restricted, found that women who obtain an unsafe procedure spend an average of US\$49 out of pocket—more than one month's per capita income—for the abortion and postabortion care combined.^{36,81}

Essential care for pregnant women and newborns prevents needless deaths and disabilities

The current level of maternal and newborn care—for women who have live births, as well as those who have miscarriages, stillbirths or abortions—prevents 170,000 maternal deaths per year, reducing the total number from what would be an estimated 460,000 in the absence of such services to 290,000 (Figure 3.4).²⁵ In addition, current levels of care avert 1.6 million newborn deaths and 161 million DALYs among women and newborns (not shown).

Providing all pregnant women with recommended maternal and newborn health care would reduce the burden of death and disability even further, protecting the future health of women and infants by lowering their risk of complications and providing immediate care for complications to those who need it. Providing the standards of care recommended by WHO to every pregnant woman would have a major impact:

- Maternal deaths would drop by 56% from the current number, to 130,000.
- Newborn deaths would drop by 72%, to 800,000.
- DALYs among women and newborns would be reduced by 71%, to 82 million.

The estimates include deaths and disability prevented among women obtaining safe abortions and postabortion care. Currently, unsafe abortion leads to 22,000 deaths and 1.5 million DALYs among women each year. Fully meeting the need for postabortion care would reduce deaths from unsafe abortion to 9,000 and would reduce related DALYs to 600,000. In addition, providing safe abortion services would further prevent death and disability. If all unsafe abortions were provided under safe conditions, the resulting number of deaths would drop to 400 and DALYs would drop to 30,000.

4

Services for HIV And Other Sexually Transmitted Infections

Sexual and reproductive health encompasses many aspects of health beyond planning and caring for pregnancies and births. From adolescence through the adult years, both men and women need information and education, as well as prevention, screening and treatment services for STIs, including HIV. For sexually active women, who are the focus of this report, the same health systems that fail to provide adequate contraceptive and pregnancy care often also fall short in preventing and treating STIs. This is partly because STIs may have few or no symptoms, and women may be unaware that they have an infection. Other problems include the stigma surrounding STIs and a lack of staff training and supplies for treating STIs in contraceptive and maternal health services. Moreover, health systems have historically separated STI and HIV services from contraceptive and maternal and child health care because of different funding sources, operational structures, priorities and target populations.^{82,83} But the failure to prevent and treat STIs can result in many health problems, ranging from pain and discomfort to debilitating illness, infertility, transmission to infants and partners, and even death—particularly in the cases of HIV and cervical cancer, which is caused by the sexually transmitted human papillomavirus (HPV).

This chapter presents new estimates of women’s need for and use of services for HIV and other STIs. In discussing women’s risk for these infections, the chapter focuses on sexual transmission, the most common route of infection among women in developing countries (as opposed to other means of infection, such as injecting drug use and blood transfusions).^{84,85} The estimates of service needs, costs and impact related to HIV focus especially on pregnant women and the prevention of mother-to-child transmission of infection. The prevention of cervical cancer is presented separately in Box 4.1 (page 30), with cost estimates from other organizations.

Estimates related to STIs other than HIV are based on survey data that are far more limited than those available for contraceptive use and maternal and newborn health care. HIV estimates have some of the same limitations; therefore, this analysis draws from existing models to supplement survey data.⁸⁶

Although the analyses presented here center on women of reproductive age who are at risk of acquiring STIs and transmitting them to their infants and partners, they do not address factors, such as stigma and gender inequality, that affect women’s risk for acquiring HIV and other STIs or the impact of these infections on their health. Nor does it examine STIs among men; key populations at high risk for STIs and HIV, such as sex workers and men who have sex with men; or vulnerable populations, such as displaced persons, who are often missed in household surveys.⁸⁷ Estimates of other STI and HIV needs and services not covered in this report are available from other sources.^{3,85,87,88}

STIs, including HIV, afflict millions of people in developing regions every year

Worldwide, more than one billion people have an STI, and every year, 1.7 million die from these infections.^{25,67,85} Every day, about one million men and women aged 15–49 contract one of four major curable STIs: gonorrhea, syphilis, chlamydia and

TABLE

4.1 Number and rate of cases of major curable STIs among women aged 15–49 in developing regions, 2014

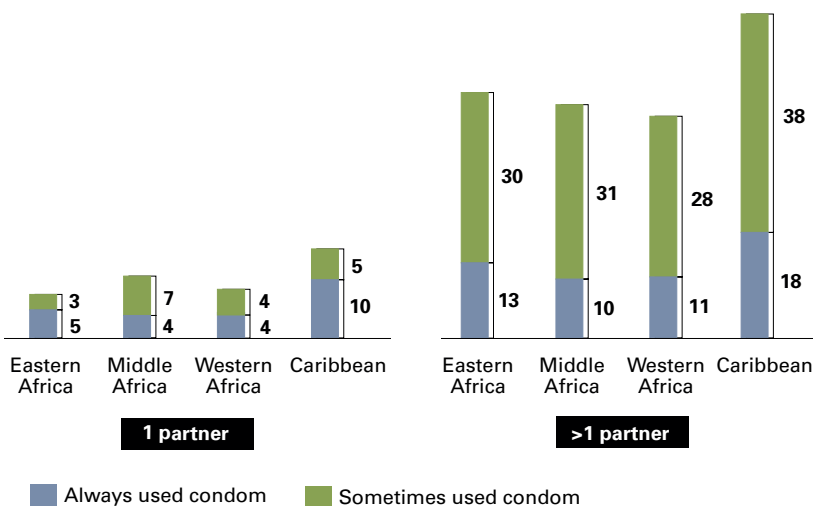
STI	NO. (000s)	RATE (CASES PER 1,000 WOMEN)
Chlamydia	43,000	28
Gonorrhea	40,000	26
Syphilis	5,000	3
Trichomoniasis	116,000	75
Total	204,000	131

Notes: Data exclude viral and other STIs, including HIV. Incidence rates for women 15–49 for 2008 from WHO are applied to the 2014 population of women aged 15–49 to estimate the number of infections in 2014. Sources: references 25 and 89.

FIGURE

4.1 Condom use is more common among women with multiple partners than among those with one partner, but consistent use is low.

% of women aged 15–49 who had sex in the past 12 months



NOTES TO FIGURE 4.1
Estimates are for 2014 for subregions where these data are available. *Source:* reference 25.

trichomoniasis.⁸⁹ In developing regions, an estimated 204 million women of reproductive age contract one of these four STIs each year (Table 4.1).^{25,89} Sexually active men and women may also be at risk of contracting viral STIs—including hepatitis B, genital herpes, HPV and HIV—which are not curable but can be managed through treatment. Although more than 30 pathogens can be spread through sexual contact, these eight infections have been linked to the greatest incidence of illness, ranking among the top five disease categories for which adults seek health care.⁸⁵ The most fatal STI by far is HIV.

Women are at risk for STIs, including HIV

Estimating the number of women at risk of contracting STIs (including HIV) through sexual behavior is difficult for a number of reasons. For instance, women and their partners may not report having multiple partners because of social stigma, especially in conservative societies. In addition, women may not report their partner’s risky behavior because they are unaware of it. Also, risk of STI infection exists but is difficult to measure in situations in which an individual or their partner has an STI with no obvious symptoms.

*Excluding additional partners within a polygamous union.

Having had two or more sexual partners in the past year and having a partner who has had other partners in the past year are good indicators of high risk for STI infection.^{*90,91} Women are considered to be at low to moderate risk if they are sexually active and if they report that they are monogamous and available data indicate that their partners are monogamous. They are considered to have no risk if they are not sexually active. Because survey respondents may be reluctant to report all their sexual partners and were not asked (and might not even know) of their partners’ behavior or infection status, the estimates of risk in this report are likely to be underestimates.

Of the 1.6 billion women of reproductive age in the developing world, an estimated 30% are not at risk for sexually acquired STIs, including HIV, because they have not been sexually active in the past year.²⁵ The majority (66%) of women of reproductive age are considered to have low to moderate risk because (based on available data) they are in mutually monogamous sexual relationships. A small minority of women are classified as having high risk of infection, because either they or their partner has recently had another partner* (4% of all women and 6% of sexually active women, or approximately 66 million women).

Latex condoms, when used correctly and consistently, reduce the risk of infection from many STIs, including HIV.⁹² In regions where adequate data are available (the Caribbean and some subregions of Africa), women at high risk for STIs because of multiple sexual partners are much more likely to report using condoms than those at low risk; still, only a minority use them consistently (Figure 4.1).²⁵ In these regions in 2014, only 4–10% of women at low to moderate risk of infection reported always using condoms over the past year, and 3–7% used them sometimes. Among women with multiple partners, 10–18% reported always having used condoms, and an additional 28–38% used the method sometimes. These data suggest substantial unmet needs for information, education and services.

HIV has a large impact on the health of women of reproductive age

According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), an estimated 35 million people were living with HIV worldwide as of 2012.³ The vast majority live in Sub-Saharan Africa, as do 90% of the children younger than 15 living with HIV.⁹³ Globally, 55% of adults living with HIV are women, a rate that is mainly attributable to higher infection levels among women than men in Sub-Saharan Africa and the Caribbean.³

For developing regions as a whole, in 2014, just under 1% of women aged 15–49 are estimated to be living with HIV, with wide variations among subregions: The proportion is lower in Northern Africa, Asia, Central America and South America (0.1–0.3%) and much higher in the Caribbean (1.1%), Middle and Western Africa (2.6–2.7%), Eastern Africa (6%) and Southern Africa (22%).⁸⁶

In absolute numbers, nearly 14 million of the 1.6 billion women aged 15–49 in developing regions are living with HIV, including 11.6 million in Sub-Saharan Africa.⁸⁶ About half a million of these women will die from HIV/AIDS in 2014.^{67,94}

Of the women living with HIV in developing regions,

- 5.5 million live in low-income countries;
- 4.0 million live in lower-middle-income countries; and
- 4.3 million live in upper-middle- and high-income developing countries.⁸⁶

Girls and young women are particularly vulnerable to HIV infection (see Box 5.1, page 35). Young women aged 15–24 account for 2.7 million (20%) of the 14 million women of reproductive age who have HIV.⁸⁶ They make up about one-tenth of AIDS deaths among women of reproductive age.^{67,94}

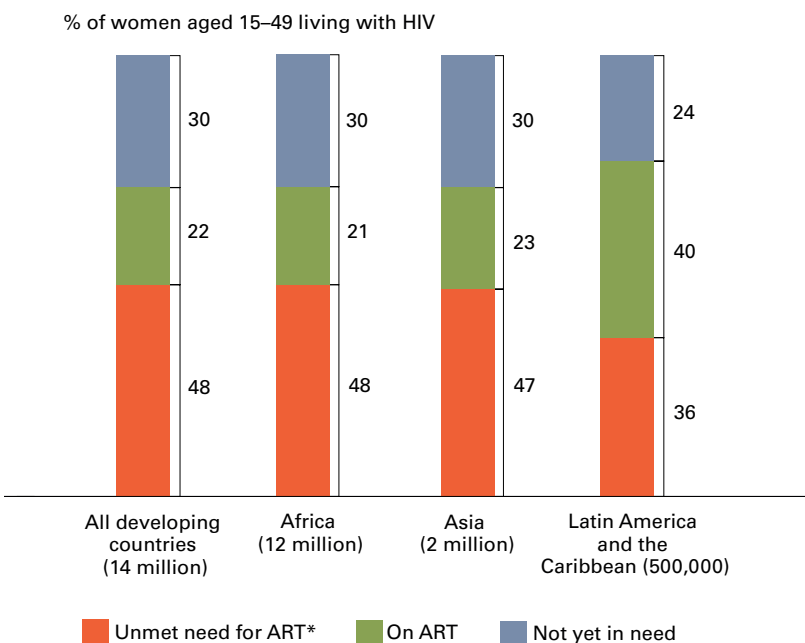
The expansion of access to antiretroviral therapy worldwide has changed the course of the AIDS epidemic. The therapy typically consists of a combination of antiretroviral medicines that suppress the HIV virus, enabling HIV-positive individuals to live longer and reducing rates of transmission.⁸⁸ HIV treatment guidelines issued by WHO in 2013 recommend starting treatment when an individual's CD4 count (a general measure of immune system functioning) falls to 500 cells per mm³ of blood or below. For pregnant women, those with infected partners and children younger than five, the guidelines recommend immediate treatment.⁹⁵

However, while just over two-thirds of women living with HIV need antiretroviral therapy, a large proportion do not receive it.[†] Access to treatment varies considerably among and within countries. Of the almost 14 million women in developing countries aged 15–49 living with HIV in 2014,

- 4.1 million (30%) are not on ART and do not yet have CD4 counts that meet the threshold for treatment;
- 3.1 million (22%) are currently receiving antiretroviral therapy; and
- 6.6 million (48%) have unmet need for

FIGURE

4.2 In developing regions, nearly half of women living with HIV do not receive the antiretroviral therapy they need.



antiretroviral therapy—that is, their CD4 count meets the threshold for the therapy, but they are not receiving it (Figure 4.2).²⁵

Many obstacles stand in the way of providing women with needed antiretroviral drugs.⁹⁶ One is that half to two-thirds of women of reproductive age have not received an HIV test and are unaware of their status.^{25,97,98} Other women know they have HIV and are eligible for treatment, but do not return for the first or subsequent stages of treatment.^{99–101} Thus, among the 9.7 million women with HIV who are in need of antiretroviral therapy, 68% have unmet need for HIV treatment. Most of the women with unmet need live in Sub-Saharan Africa (85%).

The proportion of women with HIV in need of antiretroviral therapy does not vary much across developing regions—from about two-thirds to three-fourths of women aged 15–49 living with HIV. But the proportions of those in need who have unmet need vary more significantly, from roughly half of the women in need in Latin America and the Caribbean to about two-thirds in Africa and Asia.⁸⁶

Pregnant women living with HIV need treatment for their health and to prevent transmission to their babies

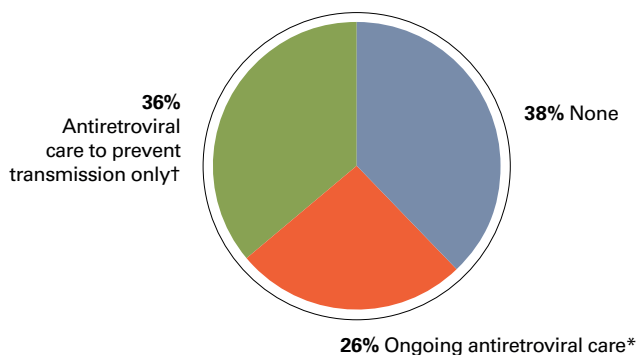
Women living with HIV who become pregnant not only need care, support and treatment for their own health and well-being, they also need it to reduce

● **NOTES TO FIGURE 4.2**
 ART=antiretroviral therapy. Numbers may not add to 100 because of rounding. Estimates are for 2014.
 *Comprises women living with HIV who are not using ART whose blood CD4 levels are ≤500 cells per mm³ (i.e., at or below the WHO-recommended criteria for treatment). Source: reference 86.

†This report likely underestimates unmet need for antiretroviral therapy because our estimate of whether women not on ART have unmet need is based solely on CD4 counts, without taking into account WHO recommendations of need for other reasons.

FIGURE

4.3 More than one-third of pregnant women living with HIV receive no antiretroviral medication.



1.5 million pregnant women living with HIV

NOTES TO FIGURE 4.3

Estimates are for 2014 for all developing regions. *WHO recommends lifelong antiretroviral medication to benefit women's health and prevent transmission for all pregnant women living with HIV (Option B+). †Antiretroviral medication to prevent mother-to-child transmission is administered only during pregnancy and breast-feeding. Source: reference 86.

the risk of transmitting the virus to their infant. Without any intervention, about one-third of babies born to women with HIV will become infected with the virus—about 20% during pregnancy and birth and another 14% through breast-feeding, though transmission can reach 30% in countries where breast-feeding lasts a long time.⁸⁶ Moreover, studies show that women living with HIV are especially vulnerable to ill-health during pregnancy and are at increased risk of maternal death.^{47,102–104} Meeting the HIV prevention and treatment needs of both women and newborns, as well as ensuring they receive adequate pregnancy-related care, is therefore vital.

WHO's strategy of eliminating new HIV infections among children and keeping their mothers alive rests on four prongs:¹⁶

- Prong 1: preventing new HIV infections among women of reproductive age
- Prong 2: preventing unintended pregnancies among women living with HIV
- Prong 3: preventing new HIV infections among infants by giving pregnant women living with HIV access to antiretroviral medicines to prevent transmission during pregnancy, delivery and breast-feeding
- Prong 4: providing HIV care, treatment and support for women and children living with HIV and their families

The strategy aims to achieve a 90% reduction in the number of new HIV infections in children and a 50% reduction in AIDS-related maternal deaths by 2015 (using 2009 as a baseline).¹⁶ Preventing new HIV infections (Prong 1) not only improves women's health, but also eliminates the possibility of

transmission from mother to child. Similarly, preventing unintended pregnancies among women living with HIV (Prong 2) is critical for improving maternal health and for reducing new HIV infections in children. Current use of modern contraception already averts 881,000 unplanned births annually among women living with HIV; of these births, 102,000 infants would have been infected with HIV.⁸⁶

Making pregnancy safer for women living with HIV has taken on new urgency in recent years in light of studies that show an association between HIV and maternal mortality. In countries with high HIV prevalence, the risk of pregnancy-related death among women living with HIV is around eight times that among HIV-negative women who are pregnant or postpartum.¹⁰² WHO estimates that as many as 40% of pregnancy-related deaths in South Africa, and 24% of those in Botswana, are attributable to the interaction between pregnancy and HIV.⁴⁷ Understanding why women with HIV are at increased risk of pregnancy-related death is a challenge, but evidence suggests that deaths are largely due to advancing HIV disease, which puts women at greater risk of sepsis, anemia and other pregnancy-related complications.^{103,104}

The realization that HIV and maternal health are so closely related has spurred discussion about adopting more integrated approaches to service delivery, so that women with HIV and their children benefit from improved HIV treatment and antenatal care (see also, Chapter 5). While increasing access to antiretroviral therapy for pregnant women living with HIV is important for reducing pregnancy-related deaths, specific attention must also be given to improving antenatal and delivery care to address the conditions that put pregnant women with HIV at risk of health complications. Attention also needs to be paid to meeting the contraceptive needs of all women living with HIV.

Fully meeting pregnant women's needs for antiretroviral therapy would cut current HIV infections among infants by 79%

The progress made over the last few years toward reducing the number of infants newly infected with HIV (Prong 3) is encouraging. Until fairly recently, these efforts to reduce mother-to-child transmission focused on providing antiretroviral medicines to women with HIV during pregnancy, labor and breast-feeding; under this approach (called Option B), women discontinue antiretrovirals when there is no longer risk of transmitting infection to their infants, unless they have need for medication because of their own CD4 count or clinical disease.

However, recent WHO treatment guidelines recommend Option B+, which aims to simplify access to services by recommending that all pregnant women living with HIV receive antiretroviral medicines during pregnancy and continue with lifelong therapy after birth, regardless of their CD4 count or clinical stage.⁹⁵ To the extent that services remain available for women who desire to continue antiretroviral medicines after the period of risk for mother-to-child transmission, this guideline change will benefit mothers' health well after pregnancy.^{84,95}

Of the 125 million women giving birth in developing regions in 2014, 1.5 million are living with HIV.⁸⁶ Of these,

- 550,000 (38%) are not receiving the recommended antiretroviral medicines;
- 383,000 (26%) are receiving Option B+; and
- 534,000 (36%) are receiving the original Option B therapy (Figure 4.3).

In countries where access to antiretroviral medicines has increased, the proportion of infants newly infected with HIV has declined. In UNAIDS' 21 priority countries in Sub-Saharan Africa^{16,88}—which account for 90% of pregnant women living with HIV worldwide—rates of mother-to-child transmission dropped quickly in only three years, from an estimated 26% of births in 2009 to 17% in 2012.¹⁶ These successes reflect the political commitment, community mobilization, technical innovation, domestic and international funding, and other forms of support for scaling up provision of antiretroviral therapy.^{88,105}

Despite these impressive gains, the number of new infections among infants remains high. In 2014, an estimated 273,000 infants (19% of births to women living with HIV) will be infected through mother-to-child transmission (Figure 4.4).⁸⁶ Among these, 130,000 (48%) will be infected perinatally (by six weeks of age) and 143,000 (52%) will be infected through breast-feeding after six weeks of age.

If no pregnant women with HIV in developing regions received antiretroviral therapy during pregnancy or breast-feeding, almost twice as many infants—495,000—would be infected, 286,000 perinatally and 209,000 through breast-feeding.

The current use of antiretroviral medicines averts an estimated 157,000 cases of perinatal transmission of HIV annually. If, in addition, all pregnant women needing antiretroviral therapy were to receive it, the number of infants infected perinatally would decline by 91%, from the current level of 130,000 to

12,000. And if mothers with HIV used it throughout breast-feeding, the number of transmissions at six weeks or later would decline from 143,000 to 45,000.

The current cost of services to prevent perinatal transmission is \$605 million for women giving birth in 2014 (\$430 million for the 48 million women who receive testing and counseling services during pregnancy, and \$175 million for the 917,000 who are living with HIV and receiving some antiretroviral medicines). If all needs for services to prevent perinatal transmission were met, these services for women who give birth would cost an estimated \$3.3 billion.[‡] This includes \$1.5 billion for HIV testing and counseling during pregnancy for the estimated 124 million women whose HIV status is unknown, at an average cost of \$12 per woman. It also includes \$1.8 billion for providing all women living with HIV with antiretroviral medicines during pregnancy and for up to six weeks after delivery, at an average cost of \$1,254 per woman giving birth who is living with HIV.

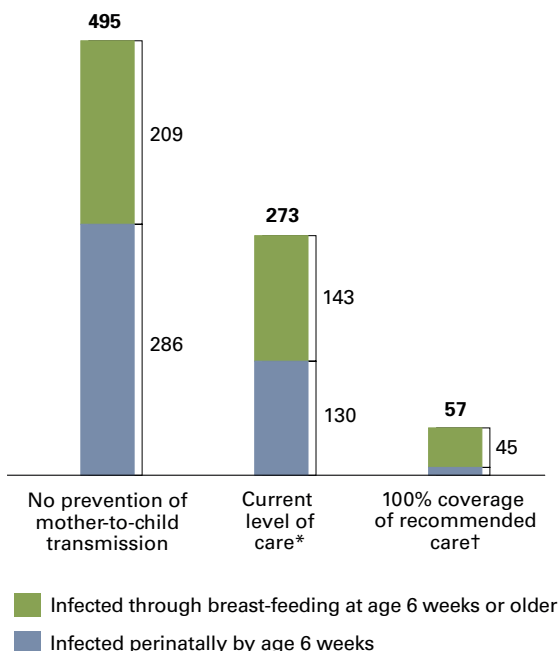
Testing and antiretroviral medicines for all pregnant women with HIV whose pregnancy ends in a live birth, miscarriage or stillbirth would cost a total of

Preventing new infections not only eliminates the possibility of transmission from mother to child; it also improves the health of pregnant women.

FIGURE

4.4 Providing ART to all pregnant women living with HIV would dramatically reduce transmission to infants.

No. of infant infections due to mother-to-child transmission (in 000s)

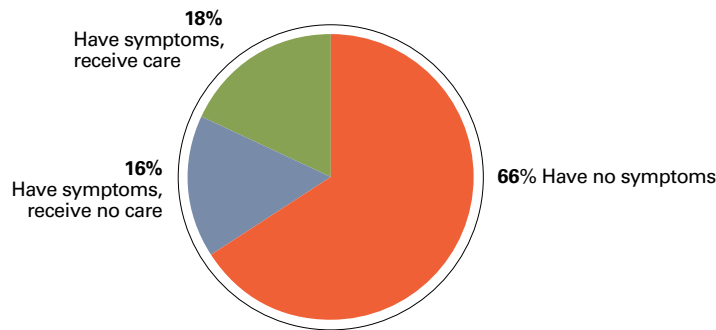


● **NOTES TO FIGURE 4.4** Estimates are for 2014 for all developing regions. ART=antiretroviral therapy. *Reflects the mix of antiretroviral regimens shown in Figure 4.3. †Assumes all pregnant women living with HIV begin antiretroviral therapy prior to or during pregnancy. Source: reference 86.

‡Because this report focuses on care during and shortly after pregnancy, cost estimates for prevention of HIV transmission from mother to infants do not include antiretroviral therapy for women or for infants past six weeks after birth or for women who have induced abortions.

FIGURE

4.5 In developing regions, an estimated eight in 10 women with a curable STI* receive no medical care.



204 million women aged 15–49 with a curable STI, 2014

● **NOTES TO FIGURE 4.5**
 *Chlamydia, gonorrhea, syphilis or trichomoniasis.
 Source: reference 25.

\$3.9 billion. The average direct cost to prevent HIV transmission to newborns is currently \$2,600 per infection averted. It would be \$3,610 per infection averted if all pregnant women who need testing, counseling and antiretroviral therapy were to receive it. The total cost per perinatal infection averted (direct costs plus program and systems costs) is currently \$4,560, and it would increase to \$14,240 if all needs for testing, counseling and antiretroviral therapy among pregnant women were met. This large increase is due to very high program and systems costs in Sub-Saharan Africa.

The current cost of HIV care for newborns younger than six weeks old is \$493 million (\$455 million for infant testing and parent counseling, and \$37 million for antiretroviral medicines). The additional cost for meeting the needs of all newborns for these components of HIV-related care is \$1.1 billion: \$796 million would cover testing for the 90 million newborns who are not currently tested, and \$298 million would pay for antiretroviral medicines for the almost 800,000 newborns of mothers living with HIV who are not currently receiving them.

STIs are extremely common but often go unnoticed in women

STIs other than HIV receive relatively little attention even though they are extremely common. Many women with these infections have few or no symptoms, and the infections can go undetected for years. When women do have symptoms, they may not seek care because of social stigma, poor access or other reasons. Yet the infections can have serious health consequences beyond the infection itself.¹⁰⁶

- Some STIs increase the risk of acquiring HIV three-fold or more.

- Some types of HPV can progress to cervical cancer.
- Some common STIs—including gonorrhea and chlamydia—can lead to pelvic inflammatory disease. If left untreated, one in four women with pelvic inflammatory disease will develop infertility,⁸⁹ for which treatment is largely unavailable in developing countries. Infertility carries a high social cost because women in many societies are expected to have children, and inability to do so can result in the dissolution of marriages.
- Mother-to-child transmission of STIs can result in stillbirth, newborn death, low birth weight, prematurity and congenital deformities.^{89,107} Syphilis during pregnancy leads to about 220,000 fetal deaths, stillbirths and newborn deaths each year, and leaves another 150,000 infants at high risk of ill-health and of dying from prematurity, low birth weight or syphilis infection.^{25,108–110}

Access to STI testing and treatment is limited in low-income countries

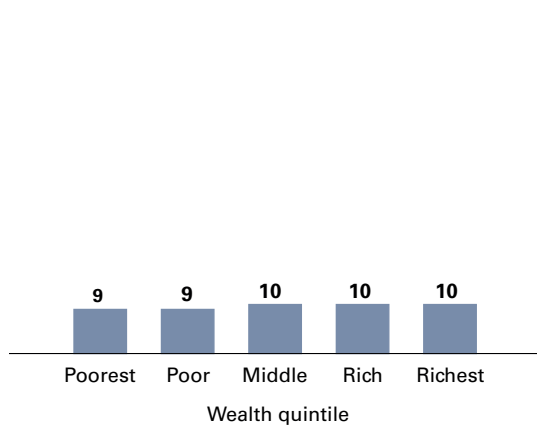
Screening for STIs requires accurate diagnostic tests, reliable procedures for case management and adequate resources. The diagnostic tests most widely used in developed countries are largely unavailable in low-income countries because of the cost of the tests and the laboratory infrastructure needed to process them. In these settings, treatment based on symptoms is the only option available to providers, but this approach applies only when women come in for care and when facilities are able to provide the necessary treatment. Even then, this approach is less effective than testing and accurate diagnosis.

The only inexpensive rapid blood test currently available to detect a curable STI is for syphilis.^{107,111} The test requires minimal training and can provide accurate results in 15–20 minutes. The availability of the rapid syphilis test has made it possible to increase the number of pregnant women tested for syphilis, but greater efforts are needed to ensure 100% of pregnant women receive the test during their antenatal visits. Currently, 54% of women are screened for syphilis during antenatal care visits.¹⁰⁸

Once diagnosed, STIs should be treated promptly. The four major curable STIs (chlamydia, gonorrhea, syphilis and trichomoniasis) can be treated with single doses of medication, although resistance to antibiotics has increased in recent years, leading to a search for new drugs and treatment options. While viral STIs have no cure, their symptoms can be managed, and vaccines for two of them—hepatitis B and HPV—have achieved

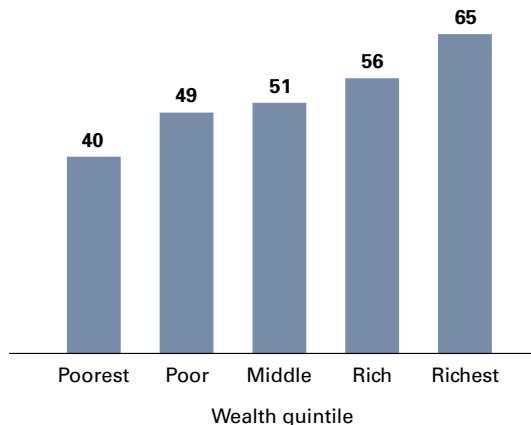
4.6 STIs affect women evenly across income strata...

% of sexually active women who reported having an STI or STI symptoms in the last year



...but medical care is skewed toward those who are better off.

% of women with an STI or STI symptoms who obtained STI care in the last year



● **NOTES TO FIGURE 4.6**
Estimates are for 2014, for women aged 15–49 in developing regions who report sexual activity in the past 12 months. *Source:* reference 25.

major advances in STI prevention. The hepatitis B vaccine is included in infant immunization programs nearly everywhere, and the HPV vaccine is being introduced rapidly in some developing countries, though it faces constraints in many others (Box 4.1).

Of the approximately 204 million women of reproductive age who have one of the four major curable STIs each year, 66% do not have symptoms, and few of these women are likely to receive medical care for their STI (Figure 4.5).²⁵ Of the women with symptoms, about one-half report receiving medical care, while the other half do not. Based on these estimates, about 167 million women (82% of those infected) have an unmet need for STI services (not including HIV care), and approximately 37 million (18% of those infected) obtain some medical care.

As with other types of reproductive health care, obtaining care for an STI varies greatly depending on a woman's economic status. While about half of all women in developing regions experiencing symptoms of an STI other than HIV obtain medical care, this is true of only 40% of the poorest women and 65% of the wealthiest women (Figure 4.6). The difference is striking given that STIs are equally prevalent across wealth categories.

Survey data provide an indication of the potential for contraceptive and maternal health services to reach some of the women who need STI care. Among

women in developing regions who are at high risk for acquiring an STI because they or their partners have multiple partners, 30% are using contraceptives that require regular resupply (and could therefore be getting STI care through a family planning provider), and 15% are pregnant or postpartum and should be currently receiving maternal health services or have had recent contact with providers of these services.²⁵ These data suggest that a substantial proportion of women could obtain the STI services they need from other reproductive health care providers or through an efficient system of referrals for STI care.

The current cost of STI treatment is relatively low, and the measured benefits are substantial

In developing regions as a whole, the current annual cost of treatment for women receiving care for the four major curable STIs is \$218 million, including both direct and indirect costs. The overall average cost per woman treated is \$6, ranging from \$4–5 in Sub-Saharan Africa and Asia to \$10 in Latin America. In addition, the cost of treatment of pelvic inflammatory disease among women with chlamydia or gonorrhea is an estimated \$105 million.⁵

Given the scarcity of data on STI treatment, only a small part of the benefits of services—those related to pelvic inflammatory disease and syphilis—can be estimated. Nevertheless, the reduction in death and disability among women and newborns is substantial:

§WHO estimates that up to 40% of women with untreated chlamydia or gonorrhea develop pelvic inflammatory disease. The cost estimates are based on that probability. *Source:* reference 89.

4.1 Preventing Cervical Cancer

Cervical cancer is caused by certain types of the human papillomavirus (HPV), the most common STI. Almost all sexually active individuals become infected with HPV at some point in their lives; the peak time for infection is shortly after starting to have sex. Fortunately, most women's immune systems will eliminate HPV naturally, but if an infection with specific types of HPV associated with cervical cancer persists, it may lead to precancerous lesions. If left untreated, these lesions may progress to cervical cancer.

Cervical cancer is the second most common cancer in women in the world, with an estimated 530,000 new cases every year.¹ Of the 264,000 deaths from cervical cancer in 2012, 86% occurred in developing countries.² Programs to prevent cervical cancer have relied largely on Pap tests to screen women for abnormal cell changes on the cervix combined with immediate treatment of lesions. While the programs have reduced cancer rates, they require quality laboratories and trained cytologists, which are rarely available in low-income countries.

New technologies and strategies are available to prevent cervical cancer at low cost. Two methods include visual inspection with acetic acid (VIA), in which a trained health provider identifies abnormal tissue. Another method involves testing for the presence of HPV DNA on a woman's cervix. If abnormal cervical tissue is found, simple technologies exist to remove it. Costs vary depending on the approaches used, but a recent analysis of the use of VIA for screening and the lowest-cost options for treating precancerous lesions found that in Sub-Saharan Africa it would cost less than \$10 per woman screened to significantly decrease cervical cancer deaths in that region in the next 10 years.³

The HPV vaccine is an important long-term strategy to reduce cervical cancer: Two vaccines have been developed that prevent infection from the types of HPV that account for 70% of cervical cancers. The vaccines have been licensed in most countries, and WHO recommends vaccinating girls aged 9–13, before they become sexually active.⁴ In 2013, the GAVI Alliance began to offer a vaccine at low cost (\$4.50 a dose) to developing countries, and more than 20 countries have been approved to introduce it.⁵ Programs are assessing the best ways to deliver the vaccine, which requires more than one dose and is the first vaccine to be targeted at adolescents.⁴

A core principle of cervical cancer prevention is to use the natural progression of the disease to identify opportunities to provide services for the right age-groups of women. It begins with vaccination of young women and men before they become sexually active. If unvaccinated, women are typically infected with HPV when they are young, but cervical cancer takes 15–20 years to develop and therefore is most likely to be seen in women aged 35 and older. Cancer may develop more quickly (in only 5–10 years) in women with weakened immune systems, however, such as those with untreated HIV infection. If precancerous lesions are not detected and treated, treatment options for cervical cancer include surgery, radiation and chemotherapy, which are generally unaffordable in developing countries and not likely to be available to the women most affected.

Key strategies for cervical cancer prevention, include

- offering HPV vaccines and sex education, including information on how to prevent STIs, to girls and young women; and
- providing women with screening and treatment for precancerous lesions.⁴

Where resources are scarce, women should be screened at least once in their lifetime between the ages of 30 and 49, and earlier if they are living with HIV. WHO recommends that all developing countries pursue both strategies, but the technologies have only begun to be introduced in low- and middle-income countries.

- Current treatment for chlamydia and gonorrhea among women prevents six million cases of pelvic inflammatory disease and prevents 1.5 million women from developing infertility related to those infections.^{25,89}
- Fully meeting women's need for chlamydia and gonorrhea treatment would prevent an additional 27 million cases of pelvic inflammatory disease and seven million cases of infertility.
- Current services to screen and treat pregnant women for syphilis prevent 60,000 fetal deaths and stillbirths, 25,000 newborn deaths and 50,000 babies from being born with congenital syphilis.^{25,108–110}
- Fully meeting women's need for syphilis screening and treatment during pregnancy would prevent an additional 110,000 fetal deaths and stillbirths and 50,000 deaths among newborns, as well as 100,000 infants from being born with syphilis.

Adding services related to the four major curable STIs is cost-effective

- The current cost in 2014 of providing services to women for the four curable STIs is \$218 million, of which \$85 million is for treatment of gonorrhea and chlamydia.²⁵
- Providing care for all women in need of these services would cost \$1.7 billion. Of this, \$640 million would be for women with gonorrhea or chlamydia.
- Looking at only one health condition—pelvic inflammatory disease from untreated chlamydia and gonorrhea—treatment costs \$105 million in 2014, and would cost \$356 million if all women with this condition received the care they need. On the other hand, providing STI care to every woman who needs it would avert these treatment costs.

5

Investing in Integrated Sexual and Reproductive Health Care

The rationale for investing in sexual and reproductive health care as an integrated package is straightforward: Sexually active individuals are exposed to multiple health risks, including unintended pregnancy, complications of pregnancy and childbirth, and HIV and other STIs. Women need care from when they first start sexual activity, as well as before, during and after a pregnancy, to lead healthy lives and avoid adverse consequences related to sex and reproduction. When a woman sees a provider, regardless of the type of care she is seeking, it is important that she has access to the full spectrum of services so that opportunities for care are not lost.

This chapter discusses the costs and benefits of meeting women’s needs for both family planning and maternal and newborn care simultaneously, as well as the costs and benefits of meeting the need for selected STI and HIV services. These services should be interconnected parts of a continuum of care that supports women’s health throughout their reproductive lives and protects their children’s health.⁵⁴ Providing care as part of an integrated package can be more effective—and more cost-effective—in meeting health needs than stand-alone programs, and it is also more convenient for women.

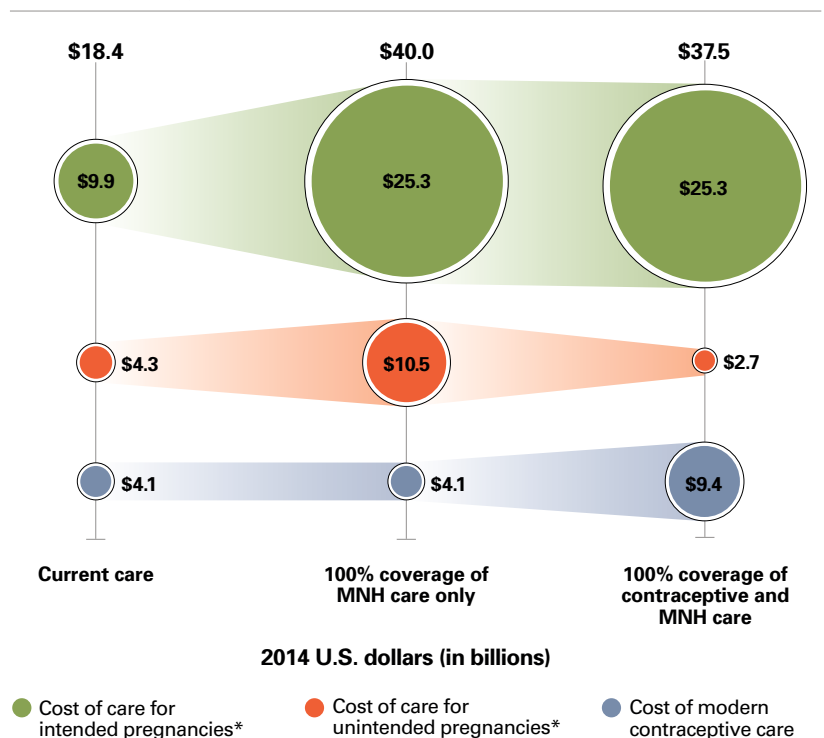
Meeting contraceptive needs would reduce unintended pregnancy and related costs

As shown in Chapter 2, if all 225 million women with an unmet need for modern contraception were to receive services under improved service-delivery conditions, the cost of modern contraceptive services would increase by \$5.3 billion—from \$4.1 billion to \$9.4 billion (Figures 2.3 and 5.1).²⁵ The increased spending would result in 52 million fewer unintended pregnancies and 21 million fewer unplanned births.

These reductions in unintended pregnancies and unplanned births would make improvements in maternal and newborn care more affordable. Providing medical care, including HIV-related care,

FIGURE

5.1 Expanding modern contraceptive services would help to offset the cost of improved maternal and newborn care in developing regions.



for women with unintended pregnancies (whether the pregnancy ends in live birth, miscarriage, stillbirth or abortion), as well as for their newborns, currently costs \$4.3 billion. But some pregnant women and newborns who are in need of care do not currently receive it, and others receive inadequate care. If all women with unintended pregnancies and unplanned births received the recommended levels of care, these services would cost \$10.5 billion. If all women wanting to avoid a pregnancy used modern contraception, the resulting decline in unintended pregnancies would greatly reduce the cost of providing the recommended standard of care by \$7.8 billion to \$2.7 billion.

● **NOTES TO FIGURE 5.1**
 Estimates are for 2014 for all developing regions. Expanded care=100% coverage for women in need of the specified services. MNH=maternal and newborn health. *Includes MNH care for all pregnancies (births, miscarriages, stillbirths, abortions) and HIV-related care for pregnant women and their newborns (HIV testing and counseling and antiretroviral care). Source: reference 25.

Reductions in unintended pregnancies would result in large declines in abortions and related health complications.

In other words, investments in family planning help offset the cost of improving maternal and newborn health care for all women. Keeping contraceptive care at current levels while fully meeting health care needs of all pregnant women and their newborns would cost a total of \$40 billion. By comparison, satisfying all unmet need for both contraceptive care and pregnancy and newborn care in developing regions provides much greater benefit at a slightly lower cost of \$37.5 billion. Treatment for the major curable STIs would raise the full cost of expanded sexual and reproductive health services to all women from \$37.5 to \$39.2 billion.

Reducing unsafe abortions saves lives and reduces health care costs

While the treatment of complications from induced abortions currently accounts for only \$232 million, or 2% of the \$14.2 billion currently spent on pregnancy and newborn care,²⁵ these complications account for 8% of maternal deaths.⁶⁰ Almost all abortion-related health problems are related to unsafe abortion; they reflect the poor conditions many women face when obtaining the procedure and that many women with complications do not receive medical care.^{71,72} If all women with complications received postabortion care, the cost of treatment would be \$562 million.²⁵

If women's contraceptive needs were fully addressed, the reduction in unintended pregnancies would result in large declines in abortions and related health complications, even assuming no change in the conditions under which abortions occur.

- Induced abortions in the developing world would decline by 67%, from 36 million to 12 million.
- Safe and legal abortions would decline by 59%, from 16 million to 6.6 million.
- Unsafe abortions would decline by 74%, from 20 million to 5.1 million.
- The number of women needing medical care for complications from unsafe abortion would decline by 74%, from 8.4 million to 2.2 million.
- The number of maternal deaths due to unsafe abortion would decline by 81%, from 22,000 to 4,200.

The current cost of abortion procedures and related postabortion care in the developing world is an estimated \$794 million, about half of which is for direct costs (drugs, supplies and personnel). The cost would rise to \$1.3 billion if all women needing care for complications of unsafe abortion received it. However, if the need for modern contraceptives were met, this would reduce unintended pregnancies, and in turn

reduce the cost of abortion care to \$255 million, and to \$368 million if all women needing postabortion care received it.

If, in addition, all abortions occurred under safe conditions, the annual number of women needing postabortion care would drop from 8.6 million to 120,000, and there would be fewer than 200 deaths annually from induced abortion. The cost of abortion services, including safe abortion services and care for the small number of women with complications, would be \$262 million.

Investing in both contraceptive and maternal and newborn health services maximizes benefits

If all women who want to avoid a pregnancy used modern contraceptives *and* all pregnant women received the recommended levels of maternal and newborn care, the total cost of these services would be \$37.5 billion annually for developing regions as a whole.²⁵

Combining investments would generate greater benefits than investing in either category of services alone.

- Maternal deaths would decline by 67% (from 290,000 to 96,000 per year); they would decline by only 56% after an investment in maternal health care alone (Figure 5.2).
- Newborn deaths would drop 77%, compared with a 72% decline from maternal and newborn care alone.

In addition, a strong body of evidence supports adding voluntary contraceptive care to services for preventing mother-to-child transmission of HIV as a particularly cost-effective strategy for saving lives.^{82,83}

- Current levels of use of modern contraception and antiretroviral therapy among women living with HIV prevent 326,000 perinatal infections each year. Yet, there are 130,000 perinatal infections annually.^{25,86}
- Fully meeting the needs of women living with HIV for both modern contraceptive services *and* antiretroviral medication would reduce perinatal HIV infections by 93%, from 130,000 to 9,000.
- If both service needs were fully met, the average cost of preventing perinatal HIV infection in an infant would be \$7,240.

Sexual and reproductive health services reinforce each other

Combining the services detailed in Chapters 2–4 of this report makes sense because improving any of the three areas of sexual and reproductive health

care can improve outcomes in another. It is more than a matter of convenience for women seeking care; it could be a lifesaver for them or their newborns, particularly if the opportunity for information and care would otherwise be missed.

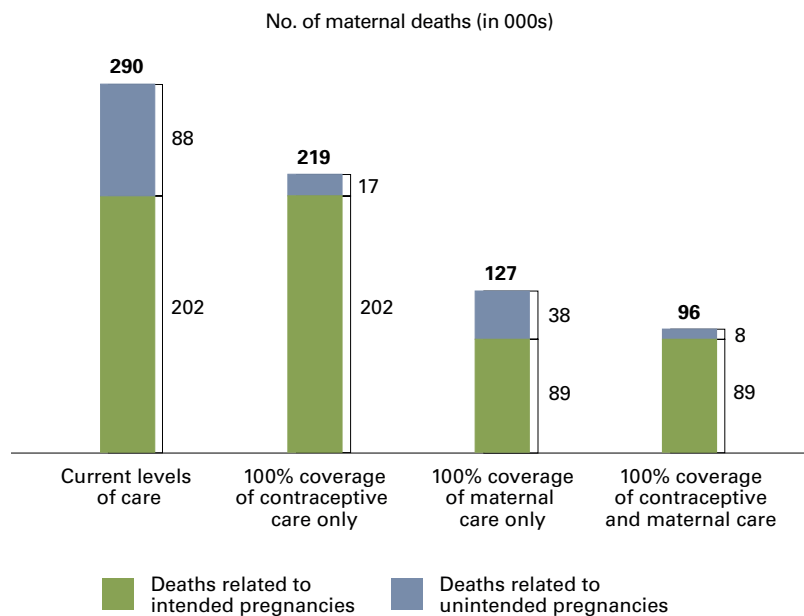
For example:

- Providers of contraceptive services can connect women with pregnancy-related care, and advise them to start antenatal care during their first trimester and to deliver their babies in health facilities.
- These providers can also advise clients to use condoms to reduce transmission of STIs, including HIV, which can in turn improve pregnancy and delivery outcomes for women and their newborns.
- Early diagnosis and treatment of some STIs, notably gonorrhea and chlamydia, can reduce the probability of HIV infection and of infertility from pelvic inflammatory disease. Early detection and treatment of syphilis among pregnant women can avert stillbirth and neonatal death.
- Postpartum and postabortion service providers can offer contraceptive counseling and supplies to help couples prevent unintended pregnancies and can connect women to ongoing gynecologic care, as well as care for their infants and children.
- HIV programs can counsel women with HIV on how to have healthy pregnancies and births, and can offer contraceptive methods and counseling to help them avoid unintended pregnancies.
- Providers of any sexual and reproductive health services can refer women who have been exposed to domestic abuse or sexual violence to the health and social services they need. Since these women face a high risk of HIV and other STIs, poor pregnancy outcomes and other health problems, connections between services are especially crucial.¹¹²

Ideally, a range of sexual and reproductive health services would be integrated at the points of care where women already receive services.^{83,113} However, in some settings, good systems of referral and linkages with facilities that provide specialized services may be more practical and effective.^{114–116} The past 20 years of research on integration and linkages among sexual and reproductive health services have not produced a one-size-fits-all approach, but have shown that different types of integration might be appropriate for different kinds of facilities and programs, depending on their resources and capacity.^{117–119}

FIGURE

5.2 Fulfilling unmet needs for modern contraceptive services and maternal health care would save women's lives.



The examples listed above describe how existing services can add components to serve their clients better. A common thread in the research on integration is that effective linkages among sexual and reproductive health programs improve access to and use of services overall. A review by WHO found that such linkages between HIV and other sexual and reproductive health services

- improve the overall quality of services;
- increase the use of modern contraceptives, HIV testing and condoms;
- improve health outcomes, including healthier behaviors;
- improve coverage of underserved populations (such as people living with HIV); and
- enhance program effectiveness and efficiency, thereby making the most of scarce public resources.¹¹⁷

Some common concerns about integration persist, such as whether the quality of services will suffer if health workers are overloaded, and whether the capacity of health systems and budgets are too constrained to support comprehensive services. Still, the balance of the literature finds that integration—even in the poorest region, Sub-Saharan Africa—is beneficial from clinical, service delivery, cost-effectiveness and human rights standpoints.¹¹⁸

● **NOTES TO FIGURE 5.2**
 Estimates are for 2014 for all developing regions. Expanded care=100% coverage for women in need of the specified services. Numbers may not add to totals because of rounding. Source: reference 25.

Where services are not well integrated, patient drop-out is a key concern: Women who receive referrals to other facilities may not follow up for critical treatments. For example, a study in Kenya showed that among women receiving pregnancy services, only 53% registered at an HIV clinic within 90 days of a HIV diagnosis.¹²⁰ And of those who learned they were eligible for immediate antiretroviral treatment, only about half returned to receive it.

Sexual and reproductive health services can also generate gains in other areas of health

In addition to reinforcing each other, sexual and reproductive health services can serve as an entry-way into the larger health system, where women can be screened and treated for other illnesses.¹¹⁵ For example, during pregnancy, women should be screened for anemia, and, depending on where they live, for malaria and parasitic infections—thus improving their chances of getting treatment for these conditions.

Investing in sexual and reproductive health services (including the supporting programs and systems) would also result in strengthening of health systems overall. These investments could increase efficiencies and save money by

- connecting women with the larger health care system, thus increasing the chances that they will seek preventive services and care for other health issues;
- increasing the training of health workers and improving their ability to provide quality services;
- referring women to nonmedical services, such as counseling and legal assistance in cases of rape or domestic violence; and
- improving responses to other health emergencies by increasing the capacity of health facilities to respond to obstetric emergencies.

Benefits also extend well beyond the health sector

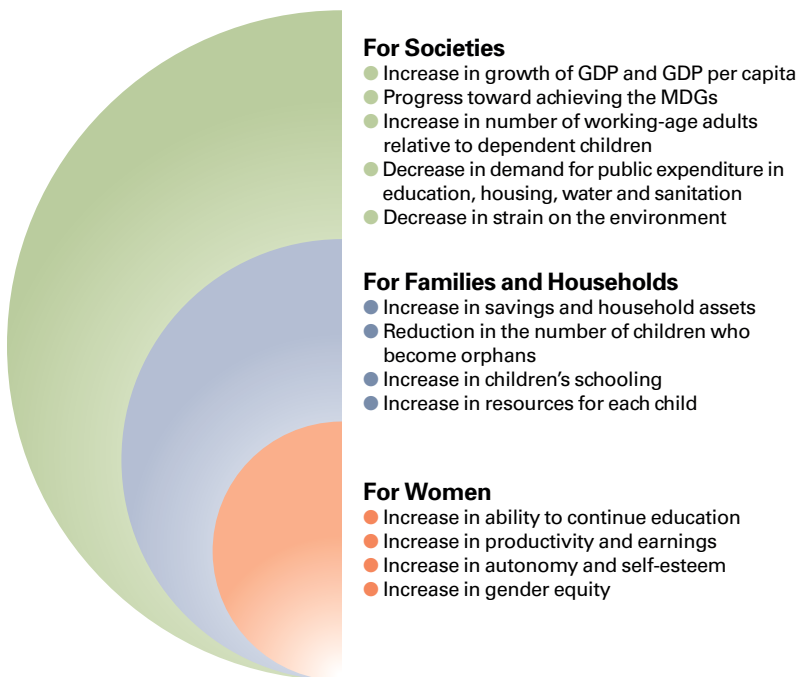
Better health and survival for women and their newborns are direct results of improvements in sexual and reproductive health care, and can be quantified. However, improvements in these services result in many additional wide-reaching benefits, such as increased productivity, improved economic well-being for households, improved status of women and increased resources for children. While these and other broad benefits are harder to document, studies indicate that the gains for individuals, families and societies are substantial (Figure 5.3).^{5,7,121–127}

Improving women's social position and quality of life.

For young women, having a birth during adolescence can curtail their prospects for education, training and employment; in the long-term, it can hurt their earnings and financial security (Box 5.1). Thus, providing sexual and reproductive health information and services early in life can help boost women's educational and earnings potential. In addition, qualitative studies looking at the effects of contraceptive use on other aspects of women's lives have shown that women who used contraceptives to time their births and avoid unintended pregnancies reported greater personal well-being than those who did not use contraceptives and had unintended pregnancies and births.¹²⁶ These studies found that contraceptive users were more likely than nonusers to communicate and share decision-making power with their husbands, and thus had more equitable household relations. Finally, ensuring women's control over their reproductive lives is essential to realizing their human rights—in particular, their right to bodily integrity and privacy and the right to make decisions concerning reproduction free of coercion, discrimination and violence (see Box 2.2, page 13).¹²⁸

FIGURE

5.3 The benefits of improved sexual and reproductive health care extend far beyond health.



5.1 Adolescent Women's Needs for Sexual and Reproductive Health Services

Adolescents,* whether or not they are married or sexually active, have special health needs in each of the areas of services that this report covers because their circumstances differ so greatly from those of adults.

Despite worldwide efforts to promote the rights of girls and end child marriage,¹ one-third of young women in developing countries other than China marry before age 18.² Early marriage is more common among women who are rural, less educated and poor than among their urban, better educated and wealthier peers.³ Those who marry young often want a child or feel pressured to have one; thus, their contraceptive use tends to be low.

Contraception and pregnancy-related care

More than half of women aged 15–19 who are sexually active and want to avoid pregnancy have unmet need for modern contraception, the highest level of unmet need among any age-group.⁴ Married adolescents who want to avoid a pregnancy, as well as unmarried, sexually active adolescents, face a range of barriers in obtaining and using contraceptives. These barriers have long been documented and include lack of knowledge, social stigma, laws and policies preventing provision of contraceptives to unmarried adolescents, and judgmental attitudes among service providers.⁵ For more than two decades, researchers and program administrators have worked to find ways to make services more accessible and appealing to youth. Dedicated services for youth at convenient locations are one strategy for attracting adolescents who avoid health facilities that cater to adults.⁶ However, such youth centers are costly and serve a relatively small proportion of young people;⁷ a more viable solution is to build the skills and change the attitudes of health providers at existing health facilities to make them more adolescent-friendly.⁶

In 2014, an estimated 12 million adolescents aged 15–19 in developing regions will give birth,⁸ and another 3.2 million will have an unsafe abortion.⁹ Complications of pregnancy (including childbirth and unsafe abortion) are the second most common cause of death in young women aged 15–19 globally.¹⁰ In addition, newborn and child death rates are higher among babies born to mothers younger than 18 than among babies born to those aged 18 and older, and the children of young mothers are more likely to be stunted and underweight.¹¹ Thus, preventing adolescent pregnancy and delaying early childbearing is a crucial starting point for improving maternal and newborn health, as well as improving women's lives more broadly. Studies in countries such as Mexico and Nigeria have shown that when girls and adolescent women are exposed to a set of interventions that include sex education, cash transfer schemes and life-skills development, they are less likely to have early pregnancies.⁵

*Age ranges used to define adolescence vary; for instance, UN agencies define adolescents as those aged 10–19, and young people or youth as those aged 15–24.

Services to prevent HIV and other STIs

Young people are generally more vulnerable to STIs than adults because those who become sexually active at an early age are more likely to change sexual partners and risk increased exposure. Most young people know little about these infections, and many are reluctant to seek services. Also, many are unaware that condoms can protect against both unintended pregnancy and STIs. Even if young people want to use condoms, they may not have ready access to them, or they may be unable to ask their partners to use them.

Women often have less power than their partners in relationships, especially if they are young, and this makes it difficult to negotiate sexual activity and condom use. Sexual violence increases girls' and young women's risk of HIV and other STIs, as does coercion—including promises of money, gifts and upward mobility, which can motivate them to have unprotected sex with older men. Young women's limited knowledge about STIs (including HIV) and low use of health services further increase their risk of infection. Marriage does not offer much protection, since young women often marry older men who have prior sexual experience and exposure to infections, as well as more power in the relationship.^{12,13}

Young people's knowledge of HIV transmission and prevention is low; they are less likely than older adults to be in contact with health services; and changing their behavior to prevent acquisition of HIV is difficult.¹⁴ As a result, young women have been hard hit by the epidemic in some countries: In 2012, about two-thirds of new HIV infections among adolescents aged 15–19 were among females, mainly in Sub-Saharan Africa.¹⁵ Alarming, in three countries in the region—South Africa, Sierra Leone and Gabon—more than 80% of infected adolescents were women. While access to HIV services had improved, survey data showed that in Sub-Saharan Africa as a whole, fewer than one in five adolescent women aged 15–19 were aware of their HIV status. Often, young women do not know their HIV status until they become pregnant and seek antenatal care.

Linking services for young people

Because of their unique vulnerabilities, young people need support to obtain various components of sexual and reproductive health care—sex education, contraception, pregnancy care, and services related to HIV and other STIs. Any time a service is offered to a young person—whether for contraceptive pills or condoms, pregnancy or STI tests, or antenatal and delivery care—it could be the first time she (or he) comes in contact with the health system. Promising programs exist in each major region, and these can form the basis for improving and expanding provision of information and services to adolescents.^{16–18}

5.2 Estimating Resource Requirements for Sexual and Reproductive Health Care in Developing Regions

Several high-level global initiatives have published estimates of the resources required to meet the need for a range of sexual and reproductive health services in developing countries. In recent years, these have included the FP2020 initiative,¹ Global Strategy for Women's and Children's Health,² and Countdown to 2015, which is coordinated by the Partnership for Maternal, Newborn and Child Health.³ Also, the United Nations Population Fund tracks resources committed annually for population and reproductive health activities.

The global estimates published by these organizations and initiatives differ from each other because each includes a different subset of sexual, reproductive and child health services. Estimates may also differ in terms of geographic coverage—for example, focusing on countries with the lowest income or with the highest burden of disease. FP2020 focuses on 69 countries with 2010 per capita incomes of \$2,500 or less, while estimates from the Partnership for Maternal, Newborn and Child Health focus on the 74 countries where 95% of maternal and child deaths occur.

Other examples of differences among estimates include

- covering only direct service costs, or covering total costs, including indirect costs, such as infrastructure, management and training of health personnel;
- covering the total costs associated with services, or covering only the additional funds needed to expand services from their current level;
- using a one-year time frame, or showing cumulative costs over a number of years;
- using a methodology based on the average cost per case for each health intervention, or summing the costs of separate types of inputs across all interventions, and
- targeting the fulfillment of all need for services, or focusing on fulfilling just a certain proportion of need.

Adding It Up covers all developing regions, permitting comparisons among poorer and better off countries. This report assesses the numbers of women needing and receiving each category of services recommended by WHO, and it provides estimates of the total costs of current services and for services that would provide recommended standards of care to all who need them. It includes both direct costs and the indirect program and systems costs that support service provision. Further, it estimates the health benefits of meeting these needs, allowing comparisons between the impact of current services and the impact that would be made by 100% coverage with recommended care.

The estimates in this report are based on the assumption that the necessary investments and accompanying changes will occur in the short-term, and that all unmet needs will be fulfilled in the near future. If all needs are not met, the costs will be correspondingly lower, but so will the benefits of the investments. Similarly, if needs are met over a longer time horizon, cost increases and benefits will be spread out as well. The growing preference for smaller families will result in an increase in the number of women needing services (all other things being equal). This, in addition to population growth in most developing regions, means that additional resources will be required to maintain the gains in service provision that are achieved.

Reducing poverty and contributing to economic growth. In 2013, a WHO study group created the Global Investment Framework for Women's and Children's Health, which used statistical models to estimate how investing in reproductive, maternal, newborn and child health could bring about high social and economic returns, in addition to health gains.¹²⁹ The study found that increasing expenditures for these services by just \$5 per person each year up to 2035 in 74 countries with very high maternal and child mortality could yield up to nine times that value in economic and social benefits, including greater GDP growth through improved productivity (Box 5.2).

A 2012 review of evidence from studies in the resource-poor areas of Matlab, Bangladesh, and Navrongo, Ghana, where community-based family planning and health programs were introduced, showed numerous benefits of contraceptive use beyond birthspacing and lower fertility (lifetime births per woman), compared with control areas.⁵ The studies showed that fertility declines were associated with an increase in women's health, earnings and participation in paid employment. In addition, the children of women in areas with family planning outreach programs were healthier and better educated than other children.

Other studies have shown that use of contraceptives contributes to a "demographic dividend"—accelerated economic growth resulting from a decline in a country's fertility and the subsequent change in the age structure of the population.^{127,130,131} With fewer births each year, the size of a country's young, dependent population grows smaller relative to the working-age population. With fewer people to support, a country has a window of opportunity for rapid economic growth if the right social and economic policies are in place.

6 Conclusions

Sexual and reproductive health care can bring enormous benefits to individuals, families and societies, but large gaps in services remain. As with other types of health care, people who need services the most are often least able to access them, and the barriers to use are complex and multifaceted—behavioral, social, economic and systemic. Therefore, improvements must be made in both the coverage and quality of services to have the most effect on health outcomes. The progress achieved over the last decade in reducing maternal, child and AIDS deaths demonstrates that it is possible to dramatically improve health in the poorest countries. But the job is not finished, and reaching everyone with these essential health services will require greater efforts on the part of national governments, international donors, NGOs and the private sector. Without adequate resources and commitment, disparities in services between poorer and better-off women—and between poorer and wealthier countries—will persist and could even grow wider.

Meeting the needs of women and their newborns would lead to large health and development gains

This report shows that meeting all unmet need for modern contraceptive services and essential pregnancy care would reduce maternal deaths by more than two-thirds, from 290,000 in 2014 to 96,000 annually.²⁵ It would reduce newborn deaths by more than three-fourths, from 2.9 million to fewer than 700,000 annually. These health gains surpass those that would result from investing in either contraceptive or maternal and newborn health services on their own. In addition, current contraceptive use among women with HIV and antiretroviral therapy among pregnant women with HIV together prevent an estimated 326,000 cases of perinatal transmission of HIV to infants in 2014.^{25,86} Fully meeting the need for both of these services would prevent 121,000 more cases—nearly eliminating perinatal

transmission of HIV—at an average cost of \$7,240 per infection averted.

Data on STI services are more limited than those for contraceptive and maternal and newborn health services. Nevertheless, based on what is known, additional gains would result from screening and treating women for curable STIs. Providing this STI care to every woman who needs it would avert a large burden of illness, including 27 million cases of pelvic inflammatory disease. And, screening all pregnant women for syphilis and providing treatment for those who need it would reduce current newborn and infant deaths by nearly 50,000 and stillbirths by almost 100,000.^{25,107}

Despite the availability of low-cost interventions to prevent and treat STIs, little progress has been made in reducing the incidence of these infections. STIs other than HIV have not received the same global attention in recent years as HIV. Because sexual health issues are generally not discussed publicly and the health effects of other STIs are less dramatic than those of HIV, there has been little political momentum to address them. The results of the limited analysis in this report suggest that the burden of illness is so large and solutions so cost-effective that STI services are long overdue for additional investment.

Sexual and reproductive health care leads to large health gains, including the prevention of death and disability due to complications of pregnancy, childbirth, unsafe abortion, HIV and other STIs, and cervical cancer. Investing in sexual and reproductive health can also bring about social and economic benefits that are not quantified in this report (Figure 5.3). For example, studies in Africa have shown that preventing maternal deaths and disabilities helps protect families from catastrophic health expenses and loss of income.^{52,81} And helping women avoid unintended pregnancies can generate savings in areas such as education, social services and

Without adequate resources and commitment, disparities in services will persist and could even grow wider.

infrastructure; preventing unintended pregnancy also contributes to reducing poverty by making families more productive and financially secure. Because of the strong evidence showing the individual and societal benefits of sexual and reproductive health care, it must remain on governments' policy agenda, including in the UN's post-2015 development agenda.^{10,14,132} Evidence of needs—both met and unmet—and of the associated costs and benefits must continue to inform that agenda.

Spending more to provide full care is an investment in the future

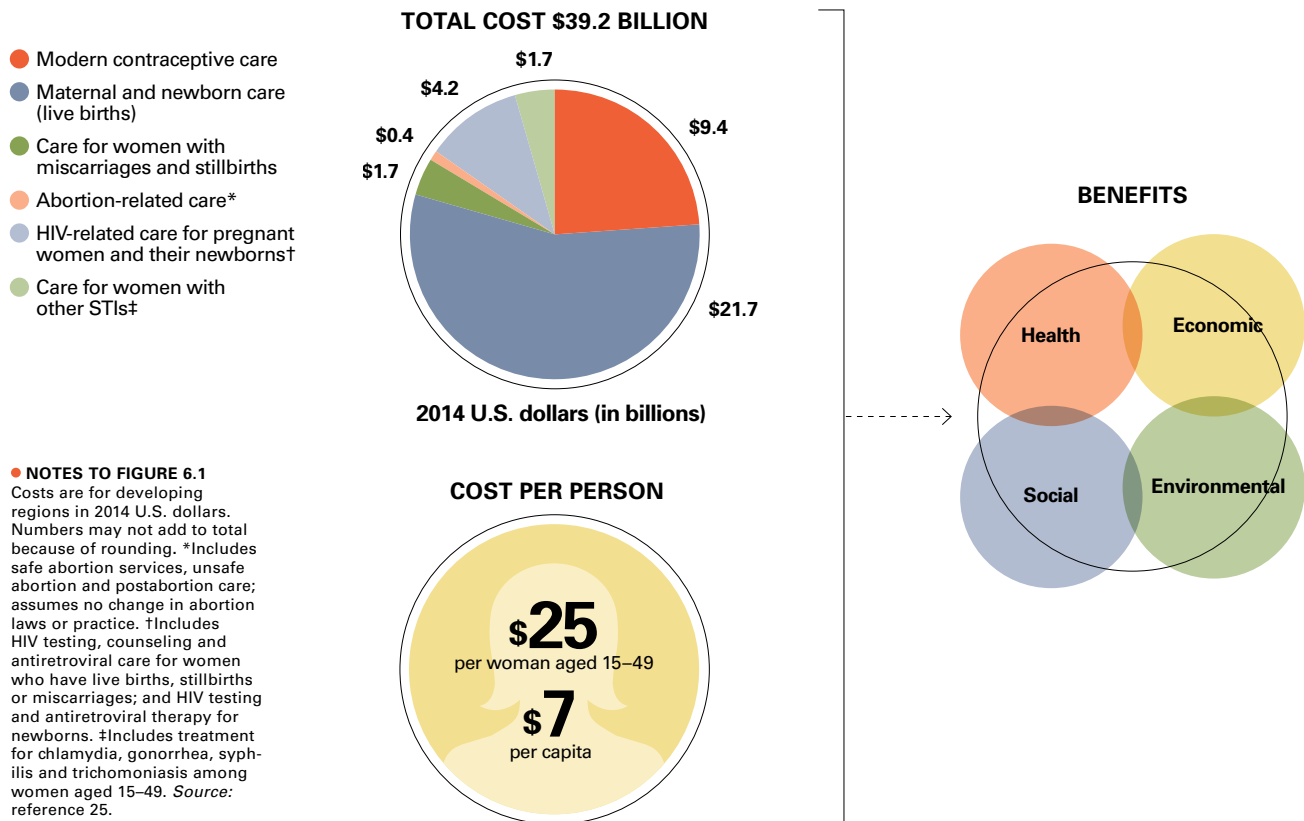
This report shows that the investments needed are cost-effective, and that spending money on some services can actually save money. Contraceptive services are a key example: By helping women choose the number and timing of their pregnancies—and thus reducing unintended pregnancies—health systems can free up funds to provide adequate sexual and reproductive health care to all who need it. Helping prevent HIV among women of reproductive age and preventing transmission of the virus to their newborns are other ways that health systems can save money.

As the previous chapters have shown, addressing women's need for a full range of sexual and reproductive health services will require significant spending (Figure 6.1).²⁵

- Meeting all women's needs for modern contraceptive services would cost \$9.4 billion annually—a substantial increase over current spending, but one that generates savings (reflected below) in pregnancy-related and newborn care, including prevention of mother-to-child transmission of HIV.
- Providing the recommended levels of maternal and newborn health care would cost \$21.7 billion for women having live births. Adding care for miscarriages and stillbirths would cost \$1.7 billion, and abortion-related care would cost \$0.4 billion.
- Meeting the needs of all pregnant women for testing, counseling and antiretroviral treatment during pregnancy and up to six weeks after delivery for those with HIV would cost \$3.0 billion annually. Meeting the needs of newborns for testing and treatment related to HIV in the first six weeks of their lives would cost about \$1.2 billion annually.

FIGURE

6.1 Providing sexual and reproductive health services for all women and newborns would cost \$39.2 billion.



- The cost of treatments for major curable STIs other than HIV is \$1.7 billion annually.

The cost of these investments for all women of reproductive age would be \$39.2 billion annually, more than a doubling of current costs for these services. But they represent average annual costs of only \$25 per woman of reproductive age and \$7 per person in the developing world.

The funds must come from a variety of sources

Who will provide the additional funds? No single source will make up the current shortfall. The supplies and services detailed in this report are paid for by a combination of national and international sources, with the ratio between external and internal resources varying substantially among countries. In general, out-of-pocket spending by individuals and households, along with international contributions, are highest in the poorest countries, while better-off countries can generally rely to a greater extent on government revenues and employer and employee contributions to health care insurance. According to the United Nations Population Fund, which tracks spending for sexual and reproductive health annually, the role played by consumers in paying for contraceptives and other reproductive health care, including services for HIV and other STIs, is much larger than usually assumed, and in many cases it exceeds spending by country governments, international donors and NGOs.¹³³

The high contribution of individuals and households toward health costs in the poorest countries has major implications for efforts to reduce poverty and inequalities: Attention must be paid to protecting the poor while expanding coverage for essential services to everyone. As noted in this report, when women do not receive adequate care during pregnancy and delivery, the cost of subsequent hospital treatment and related care (and, in the worst cases, a mother's death) often has severe consequences for poor families.

Because of the increased attention paid to global health in recent years, donor resources for health increased 11% per year between 2000 and 2010, but they have remained relatively constant since then.¹³⁴ Financial assistance for health services targeting maternal, newborn and child health; HIV and AIDS; malaria; and tuberculosis experienced the greatest growth—suggesting that the MDGs related to health (Goals 4, 5 and 6) have had a major influence on how financial assistance was allocated. Sexual and

reproductive health does not typically constitute a distinct spending category, and thus teasing out this funding from other health funding is a complex task. Overall, treatment, care and prevention of HIV and AIDS accounts for the largest share of reproductive health assistance (half or more, with much variation by region), followed by maternal and newborn care and then contraceptive commodities and services, which account for the smallest share of such assistance (10% or less).¹³⁵ Development assistance for health does not necessarily align with the disease burden in a given country. Evidence about impact and considerations of equity must continue to guide investment decisions made by donors, global and regional agencies, national governments and subnational governing bodies.

National governments are continually challenged in allocating scarce funds for competing health and development needs. Most governments in developing countries are reforming the financing and structure of their health systems, and many are moving in the direction of universal health care, in which basic services are guaranteed for everyone, regardless of ability to pay.^{14,136} Such an approach is consistent with reducing poverty and social and economic inequalities. The sources of financing for universal care may vary a great deal from one country to another, but the pooling of resources and protection of poor families through insurance schemes are likely to play a greater role in the future. In the context of universal health coverage, evidence about the costs and benefits of sexual and reproductive health must be presented and taken into account to ensure that these services are included in the package of care available to everyone.

Barriers other than lack of funds also have to be overcome

Although this report focuses on the financial resources needed for specific services, many other obstacles stand in the way of providing sexual and reproductive health services for all. For example:

- In many countries, too few trained health personnel are available because of weak education systems or “brain drain” to more developed countries. Or, sufficient personnel may be trained but are not available where they are most needed (such as in rural areas).
- Biases among health providers can prevent quality services from being available to everyone. For example, where providers have negative attitudes toward unmarried young people, the poor, certain ethnic groups or people who engage

Attention must be paid to protecting the poor while expanding coverage for essential services to everyone.

A human rights approach to health is essential for a shift in emphasis toward poor and marginalized groups.

in high-risk behaviors, many who would otherwise benefit from services may be left without coverage.

- Policy and regulatory restrictions, and weak systems for monitoring and managing the flow of supplies, can limit access to contraceptive commodities and reproductive health supplies.

These weaknesses underscore the need for increased investments in all aspects of health systems and programs, such as physical capacity to provide services; training for providers; commodity logistics systems; health management information systems; and information, education, counseling and communication programs at the individual and community levels. In addition, greater reliance on lower-level staff for some types of care would use available resources more efficiently.¹³⁷ Recent global initiatives related to family planning, maternal and child health, and HIV and AIDS are specifically focused on using evidence and sharing technical expertise to overcome obstacles that have slowed progress to date. Experience has shown that training, information, education and behavior change programs (for both providers and clients) are almost always necessary to ensure the success of technical and medical advances. Because these changes are not quick fixes, long-term commitment and sustained efforts are essential.

A lack of integration of services for sexual and reproductive health can also be an impediment to further progress. Contraception and HIV are clear examples: When a woman seeks to prevent a pregnancy, she should also be linked to services for HIV testing and care, particularly where there is a generalized epidemic. Conversely, many women seeking HIV treatment also need contraceptive services to be able to avoid unintended pregnancies. Integration of services clearly makes sense from the client perspective, but in practice many services have evolved separately, with separate funding, accountability and reporting systems. A first step to making integrated services a reality is for national policies to support service integration and linkages, including creating incentives for health providers and facilities to coordinate care. In recent years, donors and governments have increasingly recognized the benefits of these linkages—an encouraging sign that coordination is likely to improve.

Outside the health system, many social and cultural factors influence sexual and reproductive health:

- Attitudes, values and practices related to sexuality, marriage and childbearing
- Women's education, mobility and autonomy
- The persistence of gender-based violence
- Social stigma related to HIV and other STIs
- Legal restrictions and stigma surrounding abortion
- The low priority that consumers place on paying for preventive health care in general and for contraceptive services, in particular.

Linking efforts to improve sexual and reproductive health services with policies and programs in other sectors, such as education, social welfare and the justice system, could be even more effective in improving the health, well-being and productivity of women and their families.

Health investments must protect human rights

Human rights issues are increasingly taking center stage as the international community discusses health and development goals for the next 20 years. A human rights approach to health is essential for a shift in emphasis toward poor and marginalized groups. If adopted everywhere, this approach would alter the way programs are designed, implemented and evaluated. For instance, programs might set targets for the numbers of patients served, but would also set goals related to promoting and protecting individual rights, such as privacy and voluntary informed choice, and offering care in a nondiscriminatory fashion. More specifically, services could ensure that no one is turned away because they cannot pay or are not married, and that women are not pressured to use a specific service or contraceptive method.

Would such an approach lead to better health outcomes? A recent study led by WHO on human rights-based approaches to women's and children's health in four countries (Brazil, Italy, Malawi and Nepal) demonstrated that it would.¹³⁸ In each country, constitutional and international rights to health were translated into improved health services through laws, policies and programs that apply principles such as accessibility, participation, quality and accountability; these services, in turn, contributed to improved health status. The study notes that many other countries are in the process of developing human rights-based approaches and that monitoring and evaluation systems must improve to measure the impact of these approaches.

In an era when the watchwords in the international development community appropriately include “value for money” and “human rights–based approaches,” those investing in health may be concerned about whether it is feasible to achieve both of these objectives simultaneously. The evidence in this report shows that sexual and reproductive health services in developing regions are highly cost-effective, even when only health benefits are taken into account. The payoff is even greater after taking into consideration the broad benefits that accrue to women, families and society—improvements in women’s roles and status, increases in nutrition and education for children, improved economic well-being for families and increases in productivity. The bottom line is that developing country governments and their partners can make good economic choices that also support the human right to lead a healthy life. Ultimately, governments, donor organizations, employers and families should increase their investment in sexual and reproductive health care not only because it is cost-effective, but because it is the right thing to do.

Data and Methods Appendix

The estimates in this report are for women of reproductive age (15–49) living in the developing world in 2014.^{24,139–141} Country estimates are summed to obtain results by region and subregion and by countries' income category.³⁶ Where data are missing for a particular country, subregional or regional averages, or data from a demographically or socioeconomically comparable country, are used.

Estimates of Pregnancies by Outcome

As in prior reports, pregnancy estimates are calculated using multiple sources.^{20–23,142} We assumed that the 2012 subregional proportions of live births that were unintended applied to country-level births in 2014 in each subregion, as did the subregional ratios of induced abortions to unintended births.^{143,144} The subregional proportions of all abortions that were unsafe in 2008 (the most recent year for such estimates) were assumed to continue to apply to country-level abortions in 2014.⁷⁰ Miscarriages¹⁴⁵ and stillbirths¹⁴⁶ were estimated based on existing syntheses of clinical studies.

Estimates of Service Use and Unmet Need

Data sources. Nationally representative surveys are the principal source of data on women's use of and need for health services. These include Demographic and Health Surveys (DHS), U.S. Centers for Disease Control and Prevention Reproductive Health Surveys (CDC-RHS), United Nations Children's Fund (UNICEF) Multiple Indicator Cluster Surveys (MICS) and other independent surveys.

Contraception. The methodology used to develop the 2014 estimates is the same as that used for the earlier *Adding It Up* estimates,^{22,142} generating comparable data for 2003, 2008 and 2012 on use of and need for contraceptives among women aged 15–49. We used a recently released revised method for calculating unmet need³⁵ in 2014 for most countries (those with DHS and MICS surveys), and also used this method to update earlier estimates for 2003 and 2008.

Estimates of contraceptive need and use were calculated separately for currently married, formerly married and never-married women and summed to obtain estimates for all women of reproductive age. Women in each marital status group, depending on whether they wanted to delay childbearing, space births or have no more children, were classified according to their contraceptive need and use status as follows: Those using modern methods of contraception, those not in need of modern contraception, and those with unmet need for modern contraceptives (see Box 2.1, page 10, for definitions).

Estimates of contraceptive need and use for women of all marital status groups in countries in Sub-Saharan Africa and Latin America and the Caribbean come from national surveys. In Asia and Northern Africa, never-married women are often not included in such surveys, and in some countries where they are included, they are not asked questions about sexual activity and contraceptive use. Among women who are asked, underreporting of these behaviors is likely very high. Estimates of contraceptive need and use for never-married women in most countries in these regions are based on national surveys with relevant data and on a review of subnational surveys that include never-married women.²²

Maternal and newborn care. The proportions of women and newborns in need of health services beyond the basic package recommended by the World Health Organization (WHO)^{53–56} are based on published estimates of incidence or prevalence. Estimates of the proportions receiving needed health services ("met need") draw on survey information for the most recent birth in the time period covered in the data source—usually the past two years (MICS) or three years (DHS),* published studies and literature reviews, including estimates developed for the Lives Saved Tool (LiST).^{22,142,147} Otherwise, we based estimates of the receipt of care on the type of care needed, women's receipt of antenatal care and

*An exception was made in the case of India, where rapid change in the proportion delivering in health facilities was better captured by using the last full year of data from the most recent national survey, the 2007–2009 District-Level Household Survey. Source: reference 63.

whether births occurred in a health facility. Estimates of the receipt of postabortion care are from the Guttmacher Institute.⁷²

STI and HIV services. Women's risk for acquiring an STI and their level of condom use were estimated by marital status from DHS survey data and applied to numbers of women aged 15–49 in each marital status group to estimate the numbers of women by risk status. Women who had had sex in the past 12 months were considered to be at high risk for STIs if they had had two or more partners or if they had had one partner and DHS data for men in their country or region indicated it was likely that male partner had one or more other sex partners in the past year (unless they were all within a polygamous union). Women who had had sex in the last year were considered to have always used condoms if they reported a condom was used at all acts of intercourse with all partners in the past year.

The number of women acquiring chlamydia, gonorrhea, syphilis or trichomoniasis in 2014 were estimated by applying WHO regional estimates of disease incidence among women aged 15–49⁸⁹ to country-level numbers of women 15–49, assuming the same infection-specific incidence level across all countries in each region. The proportion of infected women who receive medical care was estimated from the proportion of infected women likely to have symptoms and DHS tabulations of the proportion of women who had an STI or symptoms (i.e., bad-smelling abnormal genital discharge or a genital sore or ulcer) in the past year and who sought care from a medical provider.

Estimates of HIV infection among women aged 15–49 and among women giving birth, receipt of antiretroviral medicines and mother-to-child transmission are based on data from the Spectrum AIDS Impact Model for 2012, which uses the most recent year of reported data for almost all countries (data for India covered 2011).⁸⁶ We define women in need of antiretroviral medicine to include those living with HIV who are using antiretroviral medicine, those living with HIV and not obtaining treatment who have CD4 counts of 500 cells/mm³ or less, and all pregnant women living with HIV. This definition likely underestimates need and unmet need for antiretroviral therapy because it excludes nonpregnant women living with HIV who meet WHO criteria for treatment because they have HIV-infected partners, active tuberculosis or hepatitis B infection with chronic liver disease.⁹⁵

Costs of Sexual and Reproductive Health Services

Costs were estimated separately for each component of care for which we could make estimates. All costs are expressed in 2014 U.S. dollars,¹⁴⁸ and the 2014 cost estimates are used for each of the health care coverage scenarios.

Direct costs. For direct costs, a bottom-up, or ingredients-based, costing methodology was employed. These costs were summed to arrive at a direct cost per client for each intervention component. We combined estimated proportions of women and newborns needing specific care components and the proportions receiving them with the component-specific costs to estimate total direct costs in each scenario.

Contraceptive commodity costs were estimated for each country and method on the basis of average unit costs incurred by donors for the most recent three-year time period (2011–2013), as documented in the Reproductive Health Interchange database.¹⁴⁹ Country-specific unit costs for permanent and long-acting methods were converted to annual costs by dividing total costs by the expected average number of years of use, based on USAID conversion factors: Copper IUD, 4.6 years of use; levonorgestrel IUD, 3.3 years; Implanon implant, 2.5 years; Sino-Implant, 3.2 years; Jadelle implant, 3.8 years; and sterilization, 13 years in Bangladesh, India and Pakistan and 10 years in other developing countries.¹⁵⁰ We assumed users need an annual average of four three-month injections, 13 one-month injections, 14 pill cycles or 77 condoms.²²

Because of data limitations, all other drug and supply costs (e.g., gloves, syringes, sutures) were estimated to be the same across countries in all developing regions. The cost of antiretroviral therapy was calculated from WHO Global Price Reporting Mechanism 2013.¹⁵¹ Other drug costs (including those for treating STIs) were based on the median cost cited in the current Management Sciences for Health's International Drug Price Indicator.¹⁵² Laboratory tests, supplies and personnel costs specific to HIV treatment were estimated using data from Botswana, Ethiopia, Nigeria, Uganda and Vietnam.¹⁵³ Costs for other supplies were taken from the current UNICEF Supply Catalogue.¹⁵⁴ We added 45% to the base prices of all drugs and supplies to account for shipping and wastage. Country-specific personnel salaries came from the WHO CHOICE 2005 Database.¹⁵⁵ Direct costs of hospitalization were

estimated at \$0.50 per person per day for food; other costs of hospitalization were assumed to be included in indirect costs.

Indirect costs. For the 2008 and 2012 *Adding It Up* projects, we estimated indirect costs from work done by researchers at the United Nations Population Fund (UNFPA).^{22,23,142} They estimated total indirect costs for program management, supervision, personnel training, health education, monitoring and evaluation, advocacy, information and commodity supply systems, and maintenance and expansion of the physical capacity of health facilities related to sexual and reproductive health care services other than STI management and HIV/AIDS care.¹⁵⁶ We investigated other major works in the hope of expanding these indirect costs to include more recent information on cost components, to break total indirect costs into subcategories and to expand the types of investments covered.^{129,157,158} The UNFPA estimates, for instance, did not cover costs for health financing and governance found in some of the other studies,^{129,158} and it is doubtful that any estimates include adequate costs for insuring that information and care are delivered in a way that is fully respectful of human rights, individuals' life circumstances and the needs of all groups within the population.

After extensive evaluation, we judged that each approach was so unique that reconciliation was not possible and that there was not adequate basis at this time for changing to another source or making adjustments in the UNFPA indirect cost estimates. Therefore, we continued to calculate indirect costs based on regional ratios of indirect to direct costs, as provided by UNFPA,¹³³ i.e., we assumed that UNFPA's estimated indirect cost ratio for 2008 (which reflects current levels of indirect costs before any expansion or change related to improving service provision) applies to the current scenario and the higher ratio for 2009 (which reflects expansion and improvements in service provision) applies to the scenario in which all needs are met.^{22,23,142} Given the inadequate levels of investment in recent years, we assumed it is appropriate to apply the higher 2009 indirect ratio to the future scenario to account for the costs of building capacity and improving services to fully meet the needs of all women for sexual and reproductive health services.

Total costs. Total costs are the sum of direct and indirect costs. These costs are paid for through a number of sources that vary in importance from country to country: national government budgets,

external agencies and donors, employers (through insurance benefits) and service users themselves, through contributions to insurance coverage and out-of-pocket payments for services and supplies. We estimate service costs because information on actual expenditures and the breakdown by source of payment is not available. Since most of the sources we used to estimate contraceptive commodities and other drugs and supplies reflect public-sector prices, the resulting service costs are likely to be underestimates, especially for countries with substantial private-sector service provision.

Impacts of Providing Sexual and Reproductive Health Services

We estimated a range of direct health and cost impacts for each group of services by comparing varying scenarios of health care coverage for women and newborns in need: The current (2014) level of care; a scenario in which no service needs were met; a scenario in which those currently receiving some care, such as professional antenatal care and facility delivery, would receive all WHO-recommended components of regular care and care for complications; and a goal scenario in which all women's and newborns' needs for WHO-recommended care would be met. In addition, we estimated some scenarios combining different levels of needs met for modern contraception and for maternal and newborn health care or HIV-related care for pregnant women. In terms of events averted and costs incurred, the impact of the current services is the difference between the current and the no-needs-met scenarios; the impact of the full-needs-met scenario is the difference between it and the no-needs-met scenario.

Levels of mortality and morbidity. The analysis uses the most recent available estimates from WHO and UNICEF of maternal and neonatal mortality levels, as well as distributions of deaths and disability-adjusted life years (DALYs) by specific conditions.^{47,48,60,67,159}

We estimated country-specific numbers of maternal deaths in 2014 by applying 2013 maternal mortality ratios (the most recent available) to 2014 births.^{144,160} We distributed these deaths by estimated regional causes of maternal deaths.^{47,60} We estimated deaths from abortion on the basis of the conditions of abortion provision.^{70,72} We estimated the total number of maternal DALYs in 2014 on the basis of the 2012 regional ratios of maternal DALYs to deaths^{67,159} and the number of maternal deaths in 2014.⁶⁷ We assumed that the regional distributions of maternal DALYs by cause were the same as for maternal deaths and applied to all countries in each region.^{47,60}

We multiplied 2012 country-specific newborn mortality rates⁴⁸ by the country number of live births in 2014¹⁴⁴ to calculate neonatal deaths in 2014 and distributed them by cause of death on the basis of WHO estimates for 2012.⁶⁷ We estimated the total number of neonatal DALYs from regional estimates for 2012,¹⁵⁹ inflated by the ratio of the estimated number of neonatal deaths in 2014 to those in 2012.^{48,67} We applied 2014 regional rates of DALYs per 1,000 live births to the numbers of births in 2014 in each country to estimate the numbers by country. We assumed the distribution of neonatal DALYs by region applied to all countries in each region.¹⁵⁹

Meeting the need for contraceptive services. As described above, we used external sources to estimate the total number of unintended pregnancies, by outcome, in each country in 2014. We calculated another estimate for each country by applying 12-month use-failure rates,^{†161,162} and a pregnancy rate of 40% for women wanting to avoid pregnancy who use no method,¹⁴² to the numbers of women estimated to be using each method or no method while wanting to avoid pregnancy in 2014. The initial method-specific use-failure rates and the pregnancy rate for nonusers for each country were adjusted by the ratio of the number of unintended pregnancies (from external sources) to the number estimated from method use and use-failure rates, so that the two estimates of total unintended pregnancies would be equal.

In the no-needs-met scenario, we assumed that all current users of modern contraceptives would use no method, with the adjusted pregnancy rate for nonusers. In the full-needs-met scenario, we assumed women with unmet need would use the same mix of modern methods as current users in their country, having the same marital status and desire to space or limit births. By applying the adjusted method-specific failure rates to each method-use distribution, we estimated the total number of unintended pregnancies for each scenario.

We assumed that the outcomes of unintended pregnancies in the no-method-use and full-needs-met scenarios would be similar to the outcome for all unintended pregnancies occurring in each country in 2014. Using the resulting estimates of the numbers of pregnancies ending in birth, miscarriages and induced abortions in each scenario and newborn mortality rates and maternal mortality rates for pregnancies ending in births or miscarriages, in safe

abortions and in unsafe abortions, we estimated the numbers of maternal and newborn deaths for each scenario. Lacking data to distinguish mortality and morbidity for births and miscarriages from intended vs. unintended pregnancies, we used the same 2014 mortality and DALY rates for all births and miscarriages.

Meeting the need for maternal and newborn care. We took condition-specific effectiveness rates of maternal and newborn care in reducing maternal and newborn deaths from LiST.¹⁶³ Lacking other information, we assumed the same effectiveness applied to DALYs as to deaths. Because effectiveness estimates were not available from LiST for all the interventions and because we could not model all the interventions for which LiST provides estimates, we underestimated the impacts of care.

We used the intervention effectiveness rates, country-specific maternal and newborn deaths and DALYs (by cause), and numbers of women and newborns needing and receiving cause-specific treatment, to estimate cause-specific mortality and DALY rates with and without treatment. We applied these rates to the numbers of women and newborns in each scenario who received or had unmet need for each intervention to estimate the numbers of deaths and DALYs in each scenario.

Meeting the need for STI prevention and care. Estimates in this report of the health impacts among women and newborns of prevention and care related to STIs other than HIV are limited to those arising from mother-to-child transmission of syphilis^{164,108–110} and from pelvic inflammatory disease and infertility resulting from untreated chlamydia or gonorrhea.⁸⁹

Meeting the need for prevention of mother-to-child transmission of HIV. The average probability of mother-to-child transmission of HIV varies by whether the woman was on antiretroviral drugs before the pregnancy or how soon in pregnancy antiretroviral care was started.^{147,165} In the no-needs-met scenario, we assumed no use of antiretrovirals medicines for prophylaxis or therapy among pregnant women; in the current scenario, coverage was based on the most recent national program data in Spectrum.⁸⁶ In the full-needs-met scenario, we assumed all pregnant women would use the WHO-recommended lifelong antiretroviral therapy (Option B+) and that 80% of women would continue antiretroviral therapy begun before their current pregnancy, while 20% would begin Option B+ during the current pregnancy.

†Use-failure rates take into account pregnancies that occur because of inconsistent use, incorrect use or method failure.

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