**UNFPA**

Achieving the ICPD Goals: Reproductive Health Commodity Requirements 2000-2015

United Nations Population Fund
2005

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Foreword

At the International Conference on Population and Development (ICPD) in Cairo in 1994, the world agreed on the goal of universal access to reproductive health care for all by the year 2015. This goal was further elaborated in the follow-up meeting to the ICPD in 1999: "Governments should strive to ensure that by 2015 all primary health care and family planning facilities are able to provide ... the widest achievable range of safe and effective family planning and contraceptive methods; essential obstetric care; prevention and management of reproductive tract infections, including sexually transmitted diseases."

A number of building blocks are needed to achieve the reproductive health goal spelt out by the ICPD. They include strengthened delivery systems, well-trained providers of information and services, awareness creation and information, education and communication (IEC) activities and effective programme strategies and approaches. However, all of these contributions to a well-functioning system would be meaningless in the absence of the absolutely necessary component of reproductive health commodity security (RHCS), defined as a secure supply and choice of quality contraceptives and other reproductive health commodities to meet every person's needs at the right time and in the right place. The ICPD goal of universal access to reproductive health by the year 2015 can only be achieved with universal access to reproductive health commodities.

The following report attempts to assess what it would take to meet the goal of universal access to RH commodities. It estimates what would be required to scale up commodity provision from current levels to universal coverage by the year 2015. Commodity requirements are estimated for three areas of sexual and reproductive health:

- Contraceptives and family planning supplies
- Condoms to protect against sexually transmitted infections (STIs), including HIV/AIDS
- Drugs and medical supplies required to provide an essential package of RH interventions ranging from antenatal care to delivery care to emergency obstetric care, and including basic newborn care and the treatment of STIs

For commodities in these three areas the report provides detailed estimates at regional and global level of the commodities required and the cost of these commodities. The report consists of two parts, the main report and several annexes which provide more detail on the methodology and assumptions used in the estimates. It is hoped that this report will provide a useful tool for reproductive health advocates and decision-makers at all levels in their advocacy and resource mobilization efforts for reproductive health commodity security.

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Contraceptives, Drugs, and Other Medical Supplies Needed for ICPD Reproductive Health Goals

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List of Abbreviations and Acronyms

ANC   Antenatal care
GBD   Global Burden of Disease
HIV   Human immunodeficiency virus
ICPD   International Conference on Population and Development
IUD   Intrauterine contraceptive device
PID   Pelvic inflammatory disease
PMTCT   Prevention of mother-to-child transmission of HIV
RPR   Rapid plasma reagin test
STI   Sexually transmitted infection
UNAIDS   Joint United Nations Programme on HIV/AIDS
UNFPA   United Nations Population Fund
UNICEF   United Nations Children's Fund
USAID   United States Agency for International Development
WHO   World Health Organization

Summary

Contraceptives, drugs, and medical supplies required for reproductive health services in developing regions cost US$1.84 billion in 2000, will cost $2.34 billion in 2005, and will rise in cost to $3.43 billion by 2015. Annual costs will be 86 per cent higher, in constant dollars, in 2015 than in 2000 (Figure 1). These estimates cover contraceptives for family planning, condoms for protection against HIV and other sexually transmitted infections, and drugs and medical supplies for safe deliveries and other reproductive health services. Drugs and medical supplies make up over half the total cost, contraceptives around one-third, and condoms for protection the remaining one-eighth or so.

The estimates are detailed in this report, which attempts to assess the overall costs of reproductive health commodities, which UNFPA has traditionally had a major role in helping provide for developing regions. These commodities are essential to achieve the goal of providing universal access to reproductive health care, as mandated in 1994 by the International Conference on Population and Development. The report is not intended to specify the quantities and cost of commodities needed in particular countries but rather tries to arrive at estimates of global requirements.

Nevertheless, the calculations are based on detailed consideration of regional and even country data where they are available. The report assesses the number of cases in developing regions of each relevant reproductive health condition, projects these numbers over 15 years, determines the commodities required as part of appropriate treatment, estimates the proportion of cases that do receive such treatment, specifies how coverage should rise in the future, and calculates the commodity costs for all the cases to be covered.

Assumptions and calculations are made separately for each reproductive health condition or intervention. For family planning, for instance, the report estimates the commodities required for enough couples to contracept to meet projected fertility trends. For deliveries, in contrast, the report assesses the likelihood of a normal versus a more complicated delivery, determines the proportion of deliveries currently attended by a trained provider, sets targets for such coverage of each type of delivery, and determines the commodities the providers would need to have on hand and their cost. Annexes to the report detail the methodology, which does not provide for such factors as wastage and inflation, and therefore produces conservative numbers that should be on the low side.

Figure 1. Annual cost of commodities for reproductive health in developing regions, 2000-2015 (million U.S. dollars)
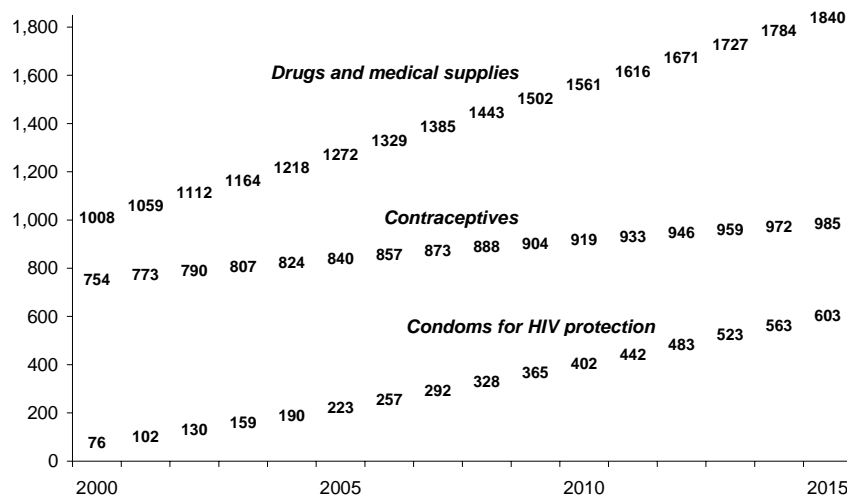
Figure 2. Cases of selected reproductive health conditions in developing regions, 2000-2015 (millions)
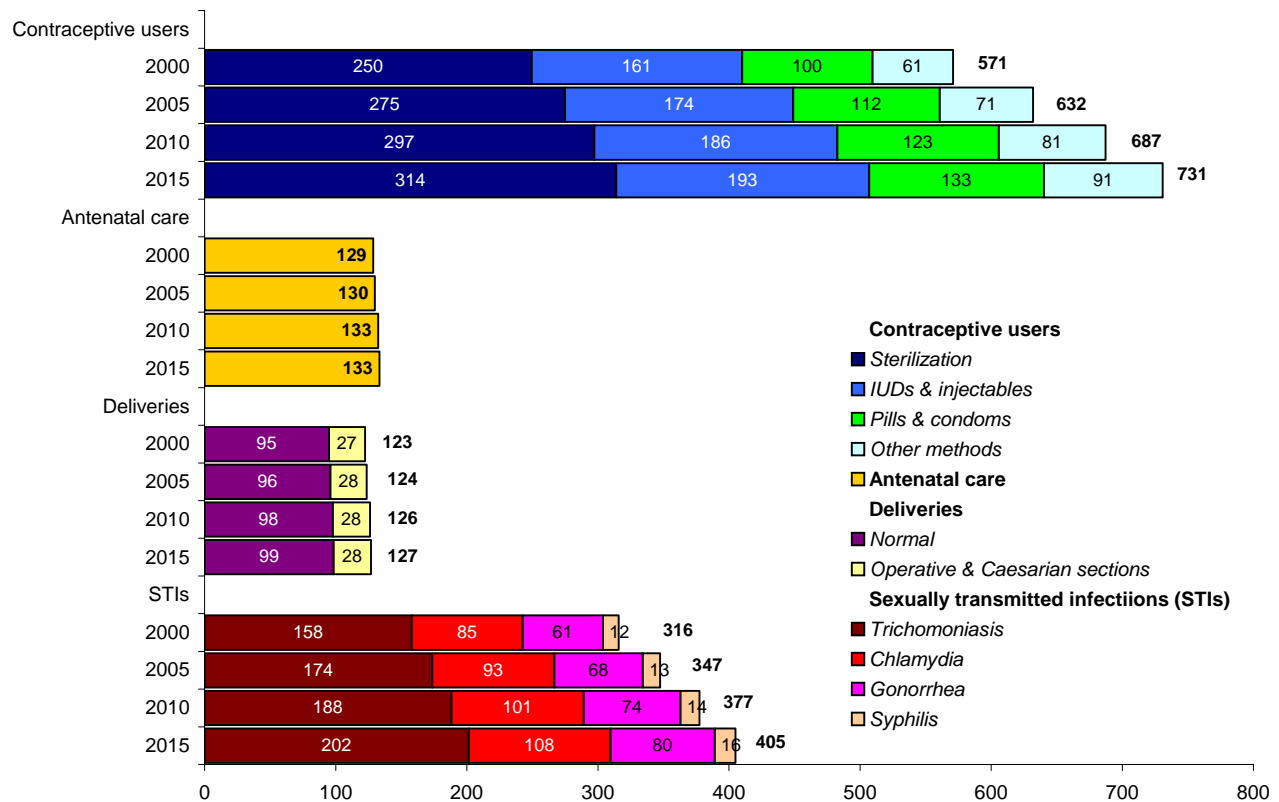
Contraceptive users in developing regions, 571 million in 2000, are estimated to rise to 731 million by 2015. They are classified by method—with sterilization taking the largest share—in order to determine the specific contraceptives and family planning supplies needed (Figure 2). Deliveries, for comparison, are projected to rise in this report from 123 million to 127 million over the same period, with about 28 million in each year being either assisted vaginal deliveries or Caesarian sections. Also estimated are cases of a variety of other conditions, such as the number requiring antenatal care (which rises from 129 to 133 million over 15 years) and the incidence of four major sexually transmitted infections (which go up from 316 million to 405 million).

Although the number of contraceptive users will rise faster than the number of deliveries, commodity costs will rise much faster for the latter. In aggregate, costs for drugs and medical supplies for reproductive health conditions will come close to doubling in 15 years, largely because many who now receive no services should begin to receive them. The cost of condoms for HIV protection will be multiplied by eight in the same period for the same reason. In contrast, contraceptive costs will grow much more slowly, by 31 per cent, because family planning services already provide somewhat wider coverage.

Across UNFPA-defined regions, commodity cost requirements are much higher in Asia Pacific than elsewhere. Even after China and India are separated, Other Asia Pacific will have the highest costs every year from 2000 to 2010. However, costs will rise fastest, both in dollars and as a percentage, in the Africa region (which includes much of sub-Saharan Africa). The increase of $482 million, or 161 per cent, from 2000 to 2015 will outstrip the increases of 110 per cent in India and 78 per cent in Other Asia Pacific (Figure 3).

Figure 3. Cost of all reproductive health commodities by UNFPA region with China and India distinguished, 2000 and 2015 (million U.S. dollars)

Region	2000	2015
Africa	299	781
Arab States/Europe	257	425
China	339	486
India	281	590
Other Asia Pacific	400	712
Latin America	256	417
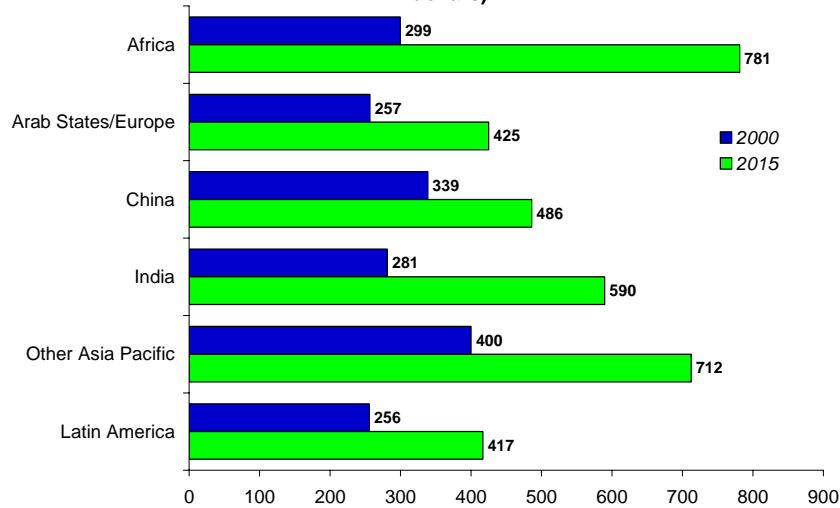
Total financial requirements for all regions can be summed up for five-year periods. For 2001-2005, commodity costs total $10.7 billion; for 2006-2010, $13.3 billion; and for 2011-2015, $16.0 billion. The estimate of year 2000 expenditures of $1.84 billion is based on numbers of cases served. If this is accurate, and if this level of funding can be maintained, that would cover 86 per cent of the cost requirement for 2001-2005, 69 per cent for 2006-2010, and 57 per cent for 2011-2015 (Figure 4). Maintaining current funding levels and sources is therefore crucial but will not be sufficient.

Figure 4. Commodity cost in 2000 for developing regions and required increments for five-year periods, 2000-2015 (million U.S. dollars)
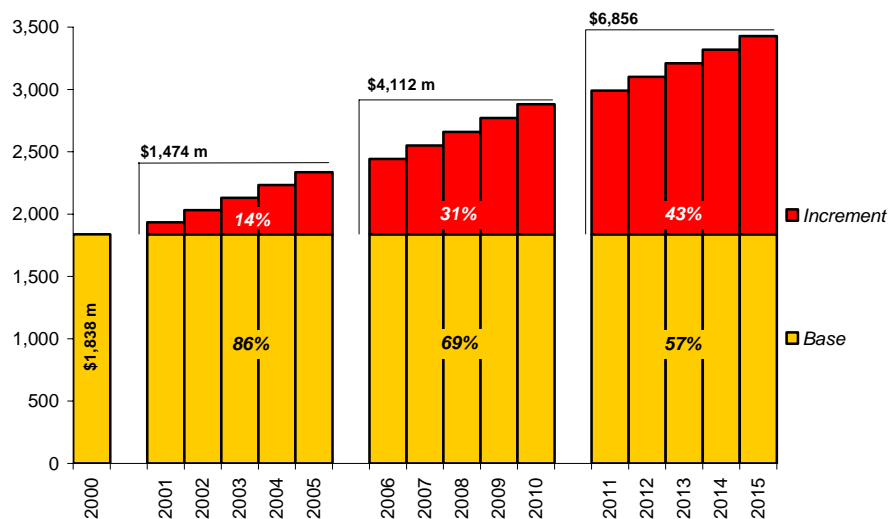
Achieving the ICPD Goals:
Reproductive Health Commodity Requirements
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With the proper drugs and medical supplies, pregnancy and childbirth in developing regions could be much safer. With the contraceptives they prefer, women might become pregnant only when they wanted to, improving the odds for themselves and their offspring. With adequate supplies of condoms, they might be better protected from HIV and other sexually transmitted infections. Contraceptives, including condoms, and drugs and related medical supplies are critical for reproductive health. This report assesses the need for these commodities in developing regions up to 2015 and seeks to estimate their costs.

These commodities are needed to provide family planning, antenatal care, normal and assisted vaginal deliveries, emergency obstetric treatment, and treatment of sexually transmitted infections. Under these headings we consider a variety of reproductive health conditions that require preventive or curative services; estimate and project the number of cases of each condition; determine what contraceptives, drugs, and medical supplies are part of appropriate treatment; assess how many cases now receive appropriate treatment and how many should be covered in the future; and calculate the commodity costs of this coverage. We also discuss newborn infections that are generally related to maternal conditions and the prevention of HIV transmission, though not HIV treatment.

The sections that follow first discuss how commodity targets are set. Then we consider, in order, contraception, condoms for HIV protection, and other reproductive health conditions. We focus on global and regional commodity requirements, not on the needs of individual countries. The results are not intended for planning country projects but to give an idea of the scope of overall financial requirements in an area where UNFPA plays an important role. Focusing on the larger picture, the discussion skips over many technical aspects of the calculations, which are spelled out in annexes, together with further detail on numbers of cases and commodity requirements.

SETTING TARGETS

In 1994, the International Conference on Population and Development set this target: "a reduction in maternal mortality by one half of the 1990 levels by the year 2000 and a further one half by 2015" (ICPD 1995: Art. 8.21). Whether the target for 2000 was met is not at all clear, but the target for 2015 was specifically reaffirmed at the Millennium Summit of the United Nations in 2000 as part of the Millennium Development Goals: "reduce by three quarters, between 1990 and 2015, the maternal mortality ratio."

While the targeted reduction in maternal mortality remains relevant, ICPD actually called for much more, for wide-ranging reproductive health services to become available. It enjoined all countries "to make accessible through the primary health-care system, reproductive health to all individuals of appropriate ages as soon as possible and no later than the year 2015" (ICPD 1995: Art. 7.6), specifying that this should include services to cover a wide variety of areas, including family planning, safe delivery, pregnancy complications, and sexually transmitted infections. (Other areas also mentioned include sexuality counseling, infertility, breastfeeding, breast cancer, and cancers of the reproductive system, which are beyond the scope of this report.)

What it means to have such services available for "all" individuals is not completely specified, though a 1999 special session of the United Nations General Assembly (labeled ICPD+5) set statistical targets—often realistically short of 100 per cent coverage—for some services. We set targets two different

ways. We assume, to begin with, that the use of contraceptives for family planning depends on the balance between demand and supply—how many people want to use contraceptives and whether they will be available—whereas the use of drugs and medical supplies for other reproductive health conditions is mainly a matter of supply—how available the commodities are.

Contraceptives and family planning supplies, it is assumed, will be used to the extent couples want to use them, and no more, provided they are in appropriate supply. To determine how many couples will want to contracept, we rely on projections of total fertility (from the United Nations Population Division). These projections reflect not official goals but best estimates of future trends. These can be converted backwards to the levels of contraceptive use that would have to exist. In effect, we assume that fertility projections are reasonable predictions of future preferences and behaviour, and estimate the commodities needed to match this behaviour.

A different approach is needed for other reproductive health commodities. Demand should not be a constraint; particularly for more severe medical conditions, one would assume that all affected women would want effective treatment. Rather, the ability to supply the needed commodities would be the limiting factor.

Providing 100 per cent coverage immediately is not feasible for most developing countries. Instead, we adopt a target of 95 per cent coverage for 2015 for each condition and assume that the capabilities of health systems will improve and coverage of affected women will rise steadily toward this level. This target itself is probably too ambitious for countries where not only poverty but also political instability and poor governance reign. We could exempt some countries from this target or set variable targets, but for simplicity we adopt instead a universal 95 per cent target. (See Annex C for alternatives.)

For condoms to protect against HIV and other sexually transmitted infections, we similarly set a fixed target, but a less stringent one. We assume condoms are needed in all incidents of risky sex but will be used, by the target date of 2015, in 80 per cent of instances of non-marital sex and 30 per cent of instances of risky marital sex, where one spouse has other sexual partners. This more lenient standard is partly a concession to the reality that interest in condom use in such settings is nowhere as strong as the desire for curative interventions, and partly a recognition that epidemics can be arrested by less than perfect coverage.

Independently of such targets, we estimate number of cases for each condition and project these numbers over 15 years. We then apply the targets in determining how widespread commodity coverage should be. Except in the case of contraceptives, we assume that the percentage of cases covered rises linearly toward the target. These calculations are run for each developing country. However, our intention is to arrive at global estimates. Since, in addition, regional and even global parameters are sometimes applied and country estimates may be unreliable, results are reported only for major developing regions.

The projections begin in the year 2000, though this has disadvantages. On one hand, ICPD targets are set for 1990-2015. On the other hand, part of the projection period has already passed as of this writing, and estimates for those dates will be in a sense historical rather than prospective. Nevertheless, because much of the data on which we rely dates from approximately 2000, we choose that date as the starting date.

The projected costs cover only supplies, not equipment nor other essential inputs, such as facilities and staff salaries and training, without which commodities could be useless. In addition, several cost factors are not taken into account in any of the calculations. Commodities are costed at presumed purchase prices, which are fixed at levels specified by relatively efficient purchasers. No provision is made for transport and delivery. Inflation is not incorporated, nor the possibility that, with increased purchases or changing treatment guidelines, some costs may decline and others may rise. Existing stocks are not taken

into account, nor are wastage and contingencies provided for. Of these factors, the most important are probably transport and delivery, contingencies, and inflation, implying that actual costs will probably be higher, perhaps by as much as 20 per cent initially, and still higher in later years.

A. CONTRACEPTIVES AND FAMILY PLANNING SUPPLIES

Having estimated contraceptive users from fertility trends, we need to distribute them by contraceptive method. We start with the latest reported country distributions and project these forward, using past cross-national experience in deriving trends in the mix of major contraceptive methods worldwide. From the projected method mix, we estimate the required volume of contraceptives and their cost. (We include the commodity costs connected with sterilization operations, which is why we also refer above to family planning supplies. See Annex A for details.)

Global results

In developing regions, an estimated 571 million women, or their partners, are believed to have been using contraception in 2000. The cost of these contraceptives, at standard prices, would be US$754 million. By 2015, contraceptive users are expected to have risen 28 per cent to 731 million, and the cost of contraceptives will reach $985 million (Figure 5; see Annex A for detailed results).

The increase in contraceptive users is due to rising numbers of reproductive-age women. Women aged 15 to 49 years are projected to go from 1.26 billion in 2000 to 1.55 billion in 2015, rising somewhat more rapidly in the earlier part of the period (United Nations 2005). In addition, overall contraceptive prevalence among these women (both married and unmarried) should inch up slightly, from 45.3 to 47.2 per cent between 2000 and 2015.

These increases are not particularly rapid. Over the 15 years, contraceptive users will grow at an annual rate of 1.65 per cent, and the cost of their contraceptives at 1.78 per cent. In absolute terms, however, the increases will be substantial. By 2005, there should be 61 million more contraceptive users than in 2000, then 55 million more by 2010, and 44 million more by 2015.

The total cost of contraceptives from 2001 to 2015 will be $13.3 billion: $4.0 billion for 2001-2005, $4.4 billion for 2006-2010, and $4.8 billion for 2011-2015. Another way to look at these figures is to consider how much the increase is over current expenditures (Figure 6). For the year 2000, financing

Figure 5. Contraceptive users and contraceptive costs in developing regions, 2000-2015
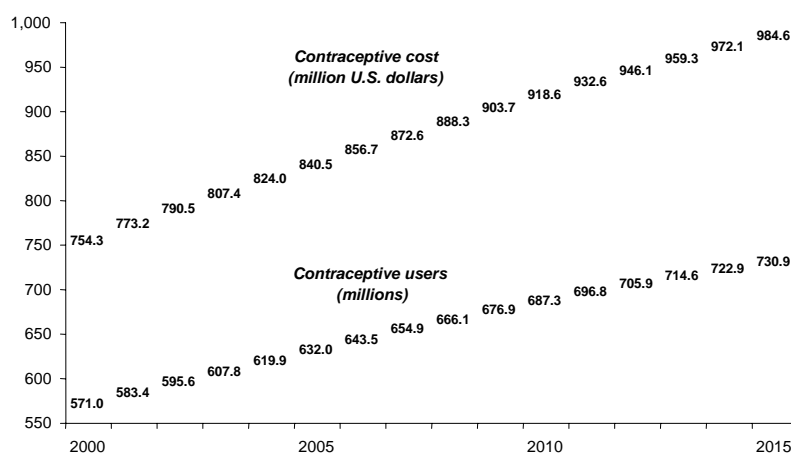
**Figure 6. Contraceptive costs in 2000 and required increments
for five-year periods (million U.S. dollars)**
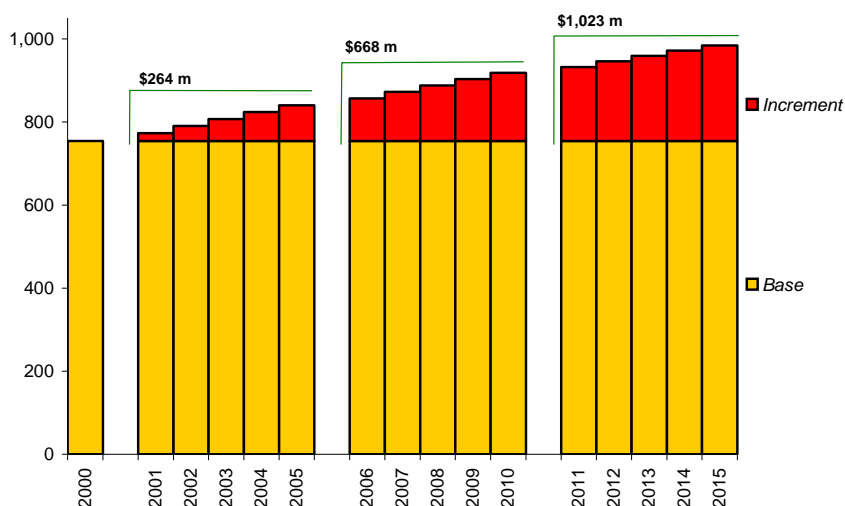
for presumed costs of $754 million must have come from a variety of sources: national and possibly some local governments, international donors and foundations, and individual households. Maintaining this base over 15 years would mean combined funding of $11.3 billion. But this would not cover all expected contraceptive use. An increment of $264 million would be needed for the five years 2001-2005, $668 million for 2006-2010, and $1.02 billion for 2011-2015, or an additional amount beyond expected base costs, for all 15 years, of $1.96 billion.

Contraceptive methods and their cost

The cost of contraceptives will grow slightly faster than the number contracepting because of changes in method mix. The contraceptive methods in use in 2000, estimated from survey data, are led by female sterilization, which accounts for over a third of users. IUDs follow, used by almost a fourth. The other major methods, in order, are pills, male sterilization, condoms, and injectables. All the remaining methods account for a tenth of users. (These are not costed. At least 95 per cent of these users rely on traditional methods.)

Use of each method is projected to increase—particularly pills, by 37 per cent by 2015, and injectables, by 31 per cent. Male sterilization is projected to show the smallest increase, though use will still grow by 11 per cent (Figure 7).

These rates of increases are not sufficiently different to greatly alter method shares. Over 15 years, no method is projected to gain or lose more than 2 percentage points of its share of users (Figure 8). However, the increases do differ enough to lead to a slightly higher average cost per user, from $1.32 for each couple for contraceptive protection in 2000 to $1.35 for each couple in 2015 (in constant dollars, and including couples who pay nothing for traditional methods). Pills, whose use will increase fastest, cost $3.60 for one year of contraceptive protection, more than three times the cost of one year of protection through female sterilization and more than 20 times the annual cost for IUDs. To see why pill use will increase faster than the use of cheaper methods, we need to look at regional patterns and trends.

Regional variation

In 2000, contraceptive users were most numerous, at 212 million, in China. Users in India were slightly fewer than half of these, at 94 million, which was slightly more than the 88 million users in all

Figure 7. Projected percent increase in demand for contraceptive commodities, 2000-2015

Units used in 2000 (millions)   *Percentage increase to 2015*

Method	Units (millions)	% increase to 2015
Female sterilization	23.9	28.2%
Male sterilization	3.8	11.0%
IUDs	37.1	17.7%
Pills	998.2	36.6%
Injectables	123.1	30.9%
Condoms	3,955.1	27.9%
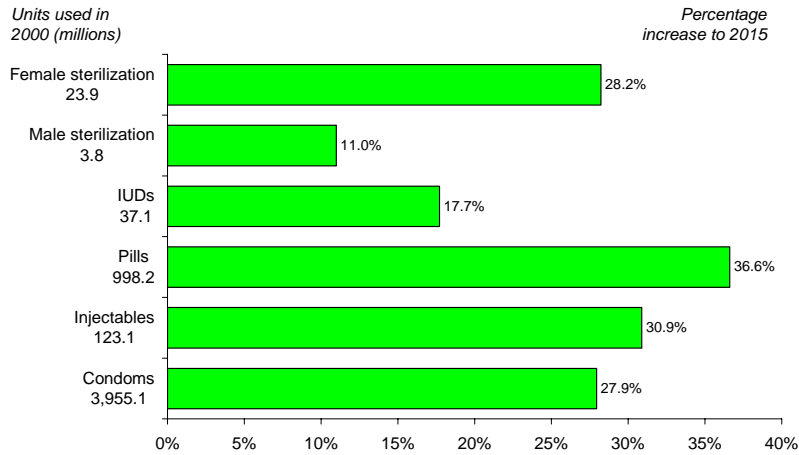
other Asian and Pacific countries (from Pakistan eastward). Latin America and the Caribbean had an intermediate total of 65 million users. Many fewer were in Eastern Europe, at 44 million, and in a swath of mostly Muslim countries from North Africa to the Middle East to Central Asia (labeled the Middle East Crescent), which had 41 million users. Even fewer were in sub-Saharan Africa, at 27 million.

Increases in contraceptive users are projected for most of these regions. The exception is Eastern Europe, where population is projected to fall 7 per cent while contraceptive users fall 14 per cent. Contraceptive use will barely rise in China, but will leap 118 per cent in sub-Saharan Africa. Nevertheless, the greatest number of additional contraceptive users will be added elsewhere, in India, which will have 51 million more users in 2015 than in 2000 (Figure 9). Large percentage increases, as in sub-Saharan Africa, may imply a need not merely for incremental improvements in services but for substantial scaling up of institutions or for actually building new ones to support family planning. In contrast, large absolute increases but smaller percentage increases, as in India, imply a greater need for commodity support.

The actual cost requirements by region do not track the number of users. China, despite its large number of users, has lower total contraceptive costs than Other Asia and Pacific. This is because the cost

Figure 8. Percent distribution of contraceptive users by method, 2000 and 2015

Method	2000	2015
Female sterilization	37.7%	37.7%
Male sterilization	6.0%	5.2%
IUDs	22.7%	20.9%
Pills	11.7%	12.4%
Injectables	5.4%	5.5%
Condoms	5.8%	5.8%
Other methods	10.7%	12.4%
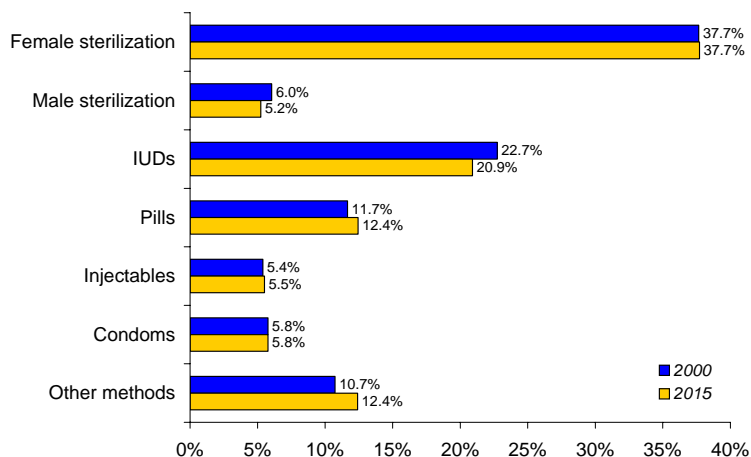
Figure 9. Projected percent change in contraceptive users from 2000 to 2015 by region and change in their numbers (millions)
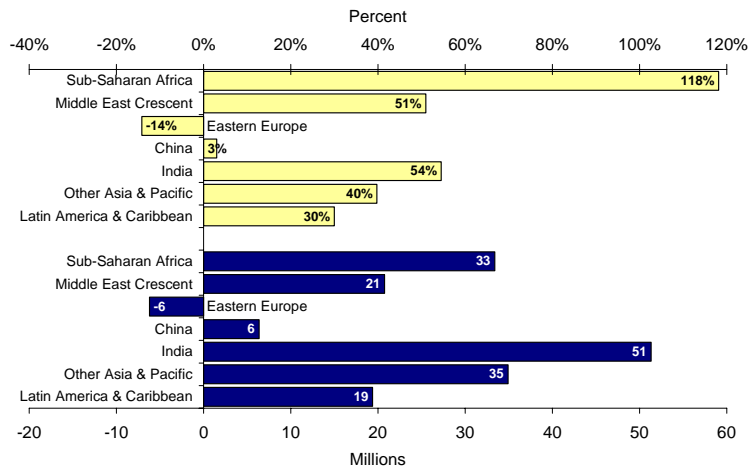
per couple-year of protection is lower in China than in any other region: $0.80, in contrast to $1.97-2.11 in Other Asia and Pacific and as much as $2.17 in sub-Saharan Africa.

Total costs over the period 2001-2015 are highest for Other Asia and Pacific, at $3.3 billion, with China far behind at $2.6 billion (Figure 10). If presumed funding levels in 2000—which we consider the base level—could be maintained over the entire period, that would fill 96 per cent of the requirement for China, but only 85 per cent of the requirement for Other Asia and Pacific, and even less—only 70 per cent—for sub-Saharan Africa.

Regional method mix

In these projections, the differences across regions in cost per user have to do with the method mix. (In reality, such factors as differences in prices and transport costs and user factors, such as the age distribution of users, would also be relevant, but none of these is modeled in these projections.) The method mix, which appears stable over time at a global level, is actually strikingly different across regions. Figure 11 orders the regions by the share of female sterilization. In general, the higher this share,

Figure 10. Total contraceptive costs by region for 2001-2015, divided into base costs and increments over 2000 levels (billion U.S. dollars)
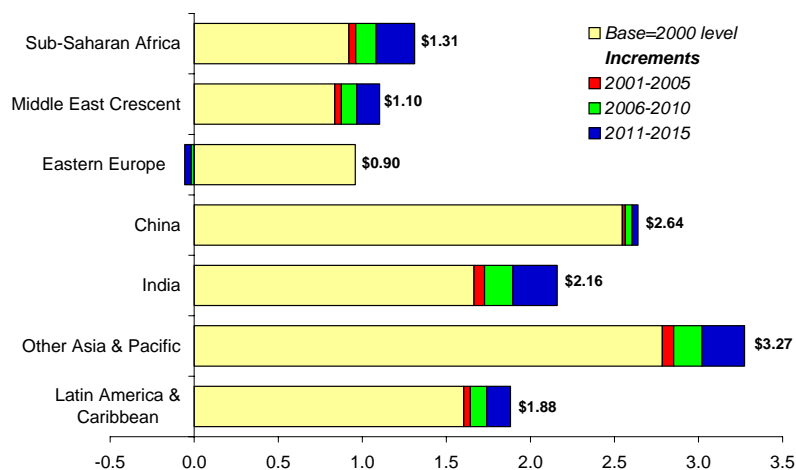
**Figure 11. Distribution of contraceptive users by method and region, 2000 and 2015**
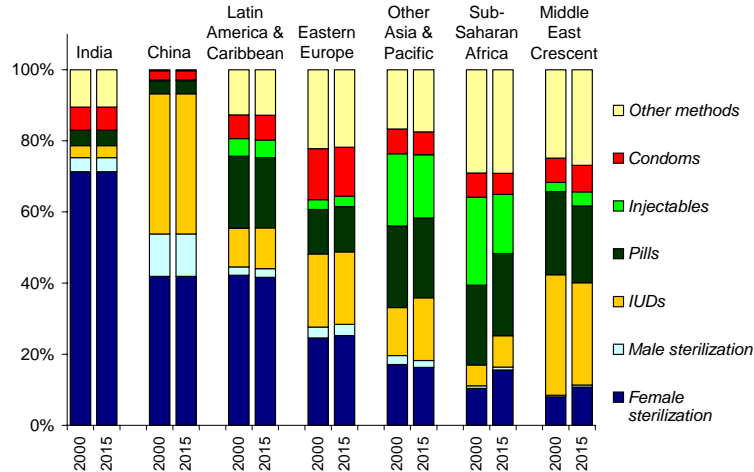
the less diverse the method mix.

• In 2000, India relied heavily on female sterilization, which had a 71 per cent share of the method mix. The category of Other methods had 10 per cent.

• China also has female sterilization as the leading method. The share of female sterilization (42 per cent) is much smaller than in India, though this represents a larger number of users. China is, however, more of a two-method rather than one-method setting, since the proportion of IUDs is almost as high, at 39 per cent. Male sterilization covers 12 per cent.

• Latin America and the Caribbean have the same share of users of female sterilization as China, but a far smaller share of IUDs. Pills (20 per cent) and Other methods (13 per cent) come before IUDs. Though larger than in India and China, the share for Other methods (mainly traditional) is smaller than anywhere else, despite the predominantly Catholic cultures of Latin America.

• In Eastern Europe, the share of female sterilization drops to 25 per cent, just ahead of Other methods (22 per cent) and IUDs (21 per cent). Condoms have a 14 per cent share, more than double the share in any other region. With the earliest and most advanced fertility transition, Eastern Europe shows greater reliance than other regions on the oldest contraceptive methods.

• In contrast to the Asian giants of India and China, Other Asia and Pacific shows great diversity of method mix. Pills, injectables, female sterilization, and Other methods each account for shares of 17-23 per cent, in descending order. Since this region covers multiple countries, it is possible that individual countries in the region tend to concentrate on fewer methods.

• Sub-Saharan Africa has a low proportion on female sterilization, only 10 per cent, though this is expected to change. Although almost half the users rely on one of two modern methods—injectables (25 per cent) and pills (22 per cent)—each has fewer users than Other methods, which has a 29 per cent share.

• The Middle East Crescent has a method mix somewhat resembling that of sub-Saharan Africa, except that IUDs take the place of injectables. The leading methods start with IUDs (34 per cent), with Other methods (25 per cent) and pills (23 per cent) following.

By 2015, method shares in each region are projected to be largely the same, even as numbers using contraception rise. The exception is sub-Saharan Africa, where the share of female sterilization is projected to rise 5 percentage points, contrasting with an 8 percentage point fall in the share of injectables. The other change to note concerns IUDs, which are projected to gain 4 points of share in Other Asia and Pacific and lose 5 points in the Middle East Crescent. These cases aside, wide regional variability in method mix appears to be mated with temporal stability.

However, the projections do not take new contraceptive methods into account. Note, for instance, how injectables—the newest among the current major methods—have captured substantial shares in Other Asia and Pacific and sub-Saharan Africa. Other emerging methods could conceivably do as well in the future.

The initial differences between regions in method mix help account for the slightly faster growth in contraceptive costs than in contraceptive users. Contraceptive use is growing at different rates across regions, slightly faster in regions with higher average contraceptive costs, because of their method mix, than in regions with lower contraceptive costs.

Differing inferences can be drawn from these contrasts among regions. From a bottom-line perspective, one could ask why particular more cost-effective methods, if they are locally acceptable, could not be more heavily promoted in high-cost regions. Where the main barriers to use of such methods are unavailability, lack of information, and misperceptions, wider use might be contemplated. However, from an alternative perspective, one could ask whether regions that focus narrowly on one or two methods are in fact providing sufficient contraceptive choice. Quality of services may be deficient where only the most cost-effective methods are provided. Nevertheless, cost and quality considerations need not be antithetical. One of the cheapest methods, male sterilization, has a share of 11 per cent in China but no more than 4 per cent in other regions. If this share could rise, both cost and quality might be served.

B. CONDOMS TO PROTECT AGAINST HIV

Among contraceptive methods, condoms have a dual role, also providing protection against sexually transmitted infections. In order to complement our estimates of condom requirements for family planning, we update previous UNFPA (2002) calculations of condom requirements for such protection. We focus primarily on HIV, but also keep other infections in mind. To determine how many condoms are


**Figure 12. Assumed number of risky sex acts per man per year:
weighted mean across countries in each region, quartiles, and ranges**
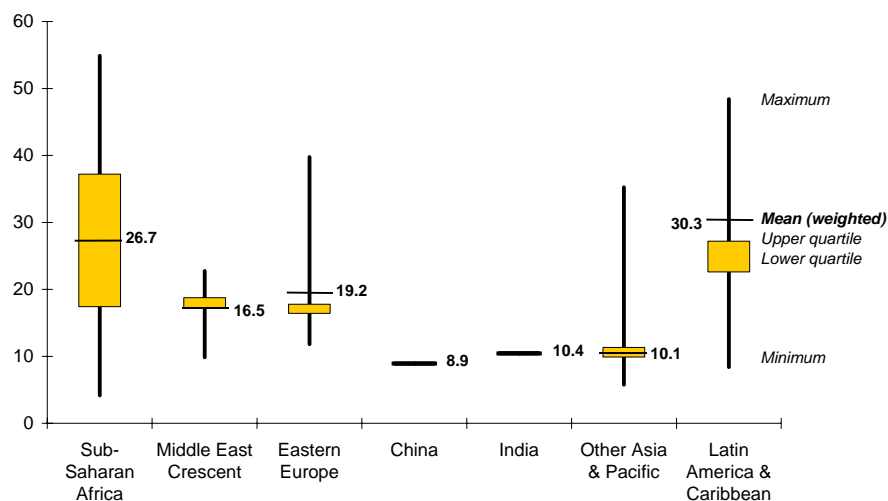
needed, we use estimates of the frequency of risky sex in different regions. Costs are then assigned based on judgments about the proportion of incidents in which condoms should be used.

Condoms required

Risky sex covers commercial sex, sex between casual partners, sex between men, and also marital sex when one partner has extramarital contacts. Its incidence, from national and smaller surveys, is about 15 episodes annually per male aged 15-59 in developing regions (Stover 2005). This rate varies, and appears to be higher in sub-Saharan Africa and Latin America and the Caribbean than in Asia, though country variation is substantial (Figure 12; see Annex B). Country estimates presumably cover a large number of men whose sexual behaviour involves lower levels of risk and some who are frequently exposed to risk—from patronizing commercial sex workers, having multiple partners, or other such behaviour.

The condoms required for protection in all episodes of risky sex in developing regions total 23.6 billion in 2000 and will rise to 26.0 billion in 2005, 28.2 billion in 2010, and 30.0 billion in 2015. These are substantial numbers relative to the 4-5 billion condoms needed annually for family planning.

It is seldom assumed, however, that the full requirement need be provided. Condom use during risky sex may be strongly advisable, but it is still voluntary, and no country is even close to 100 per cent usage. Providing complete coverage for all risky sex may not be a realistic target. We assume instead that coverage in 2000 was 15 per cent for non-marital sex and 5 per cent for risky marital sex (where one partner has other sexual contacts) and will rise to 80 and 30 per cent respectively. The condoms needed for such coverage are 2.2 billion in 2000 and will rise sharply to 15.3 billion in 2015. Requirements will rise 500 to 800 per cent in each region (Figure 13). The largest requirements will be in sub-Saharan Africa, followed by Latin America and the Caribbean. In sub-Saharan Africa, the requirement will reach eight times the requirement of condoms for family planning by 2015.

The targets of 80 and 30 per cent coverage are arbitrary. If one wanted to focus on arresting the epidemic, how many condoms are used is much less relevant than who uses them. A much smaller number of condoms could be sufficient if they were used consistently in commercial sex and other such incidents where the virus is most likely to spread. Focusing on arresting the epidemic and on specific categories of risky sex acts, and also recognizing the existence of constraints in promoting condom use, Stover (2005) estimates that coverage is much lower now and will rise only slightly, covering 13 per cent of risky sex


Figure 13. Condoms needed for family planning and for rising protection against HIV, by region, 2000 and 2015 (millions)
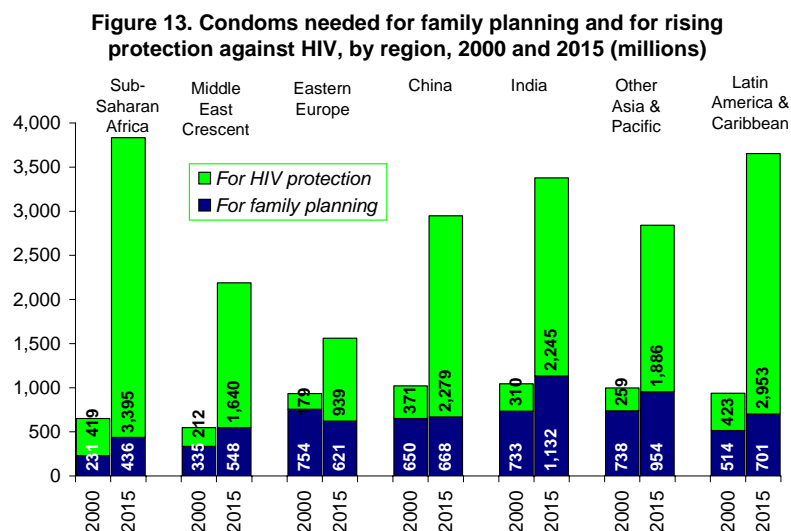
acts in 2005 and 17 per cent by 2007. Supplying only these numbers, however, would not take into account the difficulties of targeting condom use, nor the need to promote condoms broadly in the population to increase the likelihood of their use when it is most critical.

Since the focus here is not simply on arresting the epidemic but also on providing appropriate care and protection for as many as possible—and to some extent also providing protection against other sexually transmitted infections—we do not adopt the lower standard. This is not to gainsay the urgency of containing the epidemic through a concentrated focus on protection for risky sex. But assuming this can be accomplished, public health systems will have to continue to devote attention to broadening protection against such infections.

Commodity costs

The cost of condoms for protection depends not only on coverage but also on the role assigned to female condoms. At present, female condoms represent less than one-half of 1 per cent of condoms distributed, and their unit cost is more than 15 times that of male condoms. We estimate costs assuming that female condoms gradually rise to 2 per cent of the total, while their costs fall roughly in half. With the coverage trend defined above (reaching 80 per cent for non-marital sex by 2015, 30 per cent for risky marital sex), total costs would have been $76.1 million in 2000 for all developing regions, rising to $602.7 million by 2015. For successive five-year periods (2001-2005, 2006-2010, 2011-2015), costs would be $0.80 billion, $1.64 billion, and $2.61 billion respectively. Note that the last figure is 12 per cent higher than what costs would be with only male condoms. (Details are in Annex B.)

Because the assumptions about coverage are arbitrary, we consider the effects of alternatives. Assuming the low-coverage option suggested by Stover, costs would be substantially lower. Extrapolating backwards and forwards from the levels of coverage he suggests for 2005-2007 (Annex B), we find that costs would be about 30-45 per cent lower over the 15-year period. In contrast, if we assumed high coverage—initial coverage of risky sex at 50 per cent (as some data suggest) and a target of 80 per cent for both non-marital and marital sex—costs would be several times higher initially and still 50 per cent higher by 2015 (Figure 14). There does therefore appear to be a wide range of uncertainty around the cost estimates.

Figure 14 also compares condom costs for HIV protection with the cost of condoms and other

Figure 14. Cost of condoms for HIV protection for five-year periods, with alternative coverage targets, compared with family planning commodity costs (billion U.S. dollars)
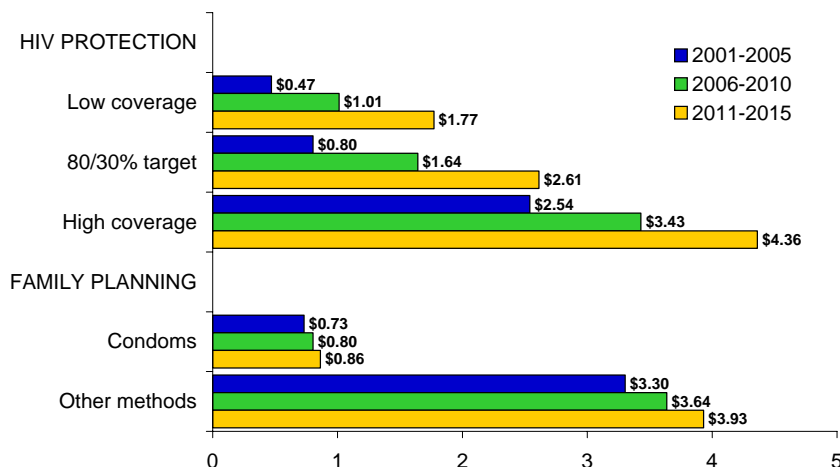
contraceptives for family planning. The cost of condoms for HIV protection already exceeds the cost of condoms for family planning (unless one adopts the low-coverage assumptions). For 2011-2015, it will be equivalent to three times the cost of family planning condoms and more than half the cost of all contraceptives combined. No single family planning method will approach the cost of condoms for HIV protection.

C. DRUGS AND MEDICAL SUPPLIES

Other commodities required in reproductive health interventions are diverse, including antibiotics, other drugs, blood products, surgical blades, syringes, gauze, etc. To be useful, these commodities must be put in the hands of trained professionals, working in properly equipped health facilities. We cost only the commodities themselves, but one should keep in mind the other requirements, which can have substantial, often much larger, costs.

The conditions for which these commodities are needed include:

- antenatal care, with regard to which we distinguish, for purposes of estimation, comprehensive basic care, malaria prevention, and malaria treatment
- normal deliveries
- major obstetric complications-maternal haemorrhage, maternal sepsis, hypertensive disorders, obstructed labour, and post-abortion complications—to which we add prolonged labour
- more complicated deliveries, particularly assisted vaginal delivery and Caesarian section
- treatment for other obstetric complications, particularly urinary tract infections, mastitis, and obstetric fistula
- major sexually transmitted infections, specifically chlamydia, gonorrhea, syphilis, and trichomoniasis, as well as pelvic inflammatory disease
- selected newborn infections, specifically neonatal sepsis, prevention of ophthalmia neonatorum, congenital syphilis, and prevention of mother-to-child transmission of HIV.

The cases involved, where antenatal care and delivery care are concerned, can be estimated based on demographic projections. For the other conditions, the situation is more complex. For major obstetric complications and sexually transmitted infections, WHO has made estimates of incidence by region. For other conditions, such estimates are not available, and we infer incidence rates from scattered studies in the literature or rely on expert advice. However incidence rates are derived, we assume they do not change over the projection period. (An alternative assumption, that these rates are affected by the services provided, reduces overall costs by just over 1 per cent over the entire period, as Annex C shows.) We apply the incidence rates to demographic data on projected numbers of births or numbers of women (depending on the condition), thus estimating the cases requiring treatment. We then follow WHO standard treatment guidelines in determining the medical commodities required, specify the quantities needed, and obtain cost estimates mainly from UNICEF (2004) price lists or the Management Sciences for Health International Price Indicator Guide (2003) (see Annex C).

Global needs

Reproductive health commodities were needed, in 2000, in relation to 122 million births in developing regions. A slightly larger number of women, perhaps 129 million, required antenatal care. Some 26 million women, many of whom did not receive appropriate services, experienced major pregnancy complications. There were in addition over 360 million new cases of four major sexually transmitted infections (other than HIV) among both adult women and adult men.

Figure 15. Births, major obstetric complications, and major sexually transmitted infections, 2000-2015 (millions)
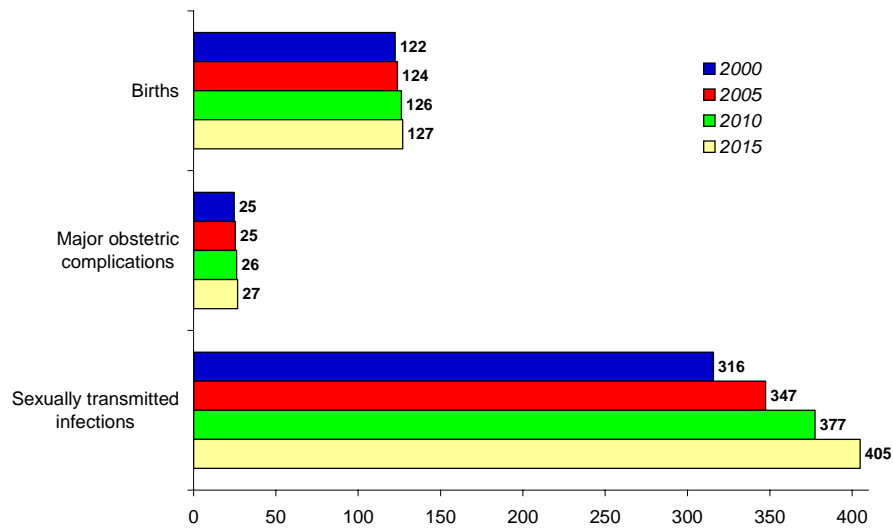
By 2015, births will be only slightly more numerous at 127 million, and major pregnancy complications will increase slightly to 27 million. However, with the number of adults increasing faster than the number of babies, new cases of sexually transmitted infections will rise much faster, exceeding 400 million (Figure 15).

To provide the drugs and medical supplies for the reproductive health services we consider—for basic pregnancy care, to treat the complications women experience, to cover major sexually transmitted infections—would have cost $1.83 billion in 2000. We do not know what was actually spent. If we go by rough estimates of the proportion of women and conditions covered by services (and apply standard treatment guidelines and prices) we would estimate that about $1.01 billion was spent on commodities, or only 55 per cent of the need. By 2015, $1.94 billion will be required for complete coverage. What will be required in that year if coverage is less than perfect depends on the specific level to be attained.

To attain 95 per cent coverage in 2015, developing regions would have to spend $1.84 billion in that year on drugs and medical supplies for the reproductive health services we consider (coincidentally almost the same amount required for full coverage in 2000). Steady progress toward this target would involve five-year costs of $5.83 billion for 2001-2005, $7.22 billion for 2006-2010, and $8.64 billion for 2011-2015. The increase over current costs would be substantial. If we treat estimated 2000 expenditures of $1.01 billion as a base and assume the funding for this will continue, funding for 2006-2010 would still have to be 43 per cent higher, and for 2011-2015, 71 per cent higher (Figure 16).

Conditions, cases, and commodity costs

These estimates are bottom-up rather than top-down estimates, built up by detailed consideration of 24 separate medical conditions or treatments using country data where possible—though often only regional data are available—on the incidence of each condition, the population base to which it applies, and the proportion of cases receiving services (Annex C). The medical conditions and treatments that go into the global estimates can be considered in five broad groups.

Antenatal and normal delivery care. Antenatal care includes services that, for the most part, are provided to all pregnant women. Such items as tetanus toxoid immunization, vitamin supplementation, and various medical tests are included. An estimated 129 million women required these services in 2000, and the number will rise 3 per cent by 2015 to 133 million. The number actually receiving these services

Figure 16. Cost of drugs and medical supplies in 2000 and required increments for five-year periods to 2015 (million U.S. dollars)
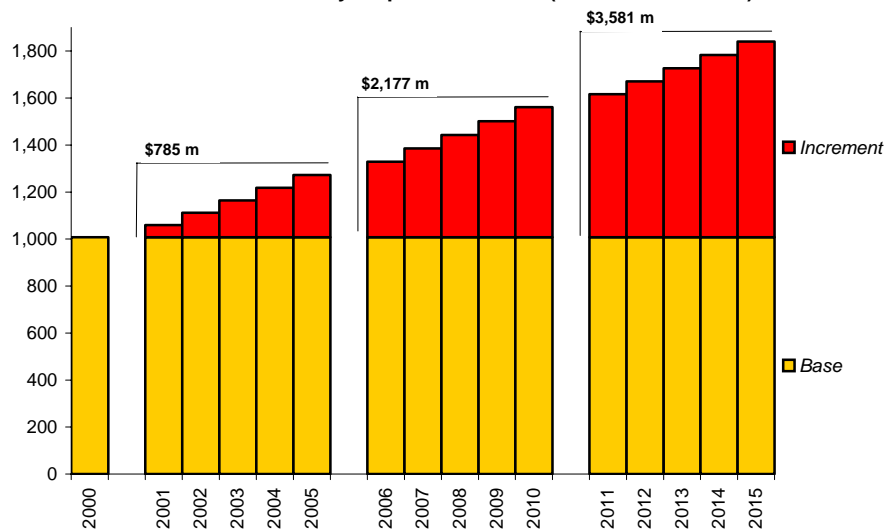
is lower, estimated at only 68 per cent of the total in 2000. This is based on proportions of pregnant women seen at least once by a trained health provider, though we cannot be sure that these women actually received all the recommended services. The target for 2015 for antenatal care, as for all other services, is 95 per cent coverage, which would mean 127 million women.

The items under antenatal care that are not to be provided universally are malaria prophylaxis—only for areas where malaria is prevalent—and treatment—only for those actually infected. From WHO malaria prevalence data, prophylaxis should be needed by 26-29 per cent of those receiving antenatal care, and actual treatment by 1.6-1.8 per cent. (The percentages are expected to vary only slightly over time.)

Care for normal delivery (spontaneous vaginal delivery) involves fewer women than antenatal care because more complicated deliveries are excluded, as well as miscarriages and induced abortions. The numbers requiring normal delivery care are estimated indirectly, by taking rates for prolonged and obstructed labour, assigning high proportions of these to more complicated procedures, and labeling the remaining births as normal deliveries. About 95 million normal deliveries in 2000 are estimated, 78 per cent of total births. Of these, only 55 per cent were properly attended in 2000, meaning that the increase in coverage will have to be faster, to meet the target, than for antenatal care. (Figure 17 summarizes this information and compares these conditions with the others to be discussed.)

At actual coverage levels, these services combined required commodities costing $712 million in 2000. To meet the 95 per cent target, commodity spending will have to be $1.10 billion by 2015, an increase over 2000 of 55 per cent. Spending would have to be $56 million higher in 2015 if all cases were to be covered (Figure 18). Antenatal care commodity costs are higher than those for most other conditions to be considered, because of the number of women involved. The proportional increase in commodity costs will not however be as large as for other conditions, because we assume that coverage is already somewhat better than average for antenatal care.

Major pregnancy complications and their treatment. Five complications are responsible for the majority of maternal deaths: haemorrhage, sepsis, hypertensive disorders, obstructed labour, and post-abortion complications. Assuming these conditions do not overlap, they would have affected 25 million women in 2000. Numbers of cases of haemorrhage, sepsis, and obstructed labour were each between 5.4 and 5.8 million; maternal hypertension affected 4.1 million; and the number with post-abortion

Figure 17. Cases of selected reproductive health conditions, divided into those covered by services and not covered, 2000 and 2015 (millions)

	Covered	Not covered
Antenatal care		
2000	87.2	41.4
2015	126.8	6.5
Normal delivery		
2000	52.7	42.3
2015	93.8	4.7
Major complications		
2000	9.9	14.7
2015	25.4	1.3
Operative delivery		
2000	6.6	9.3
2015	15.7	0.8
Caesarian section		
2000	4.7	6.9
2015	11.4	0.6
Other complications		
2000	20.3	28.7
2015	48.3	2.5
Sexually transmitted infections		
2000	132.9	182.9
2015	384.6	20.2
Ophthalmia neonatorum		
2000	50.8	71.7
2015	120.6	6.3

complications requiring treatment was 3.8 million. Unsafe abortions, the major, avoidable cause of post-abortion complications, probably numbered five times as many. Four of these conditions should increase only slightly, by 4-5 per cent, by 2015. Post-abortion complications should rise 28 per cent. The proportion receiving services is estimated, for 2000, at only 40 per cent, and will have to increase much faster than the increase in conditions to meet targets.

Prolonged labour, if it does not involve obstructed labour, is not as serious a complication but may still require assisted vaginal delivery. We therefore treat it with this group of complications (though when we refer to major complications, we do not count these cases). Our estimate is 6.4 million cases in 2000 (excluding obstructed labour), with only a slight increase through 2015 but a large increase in the number of cases covered by services from 2.5 million to 6.3 million.

If prolonged or obstructed labour cannot be handled otherwise, operative vaginal delivery, using forceps or vacuum extraction, or even Caesarian section may be needed. These procedures may also be needed in other circumstances. Assisted vaginal delivery was required in 2000 in an estimated 15.9 million cases (13 per cent of births), Caesarian section in about 11.5 million cases (9.4 per cent of births). About 60 per cent of the time, however, these procedures were not performed when needed. The numbers of procedures required should not change greatly through 2015, but coverage of such cases should expand considerably if targets are to be met (Figure 17), raising the required spending on commodity costs.

The commodity costs for this set of conditions—major complications, prolonged labour, assisted vaginal delivery, and Caesarian section—are considerable. At 2000 coverage levels, costs would have been $273 million. By 2015, with coverage rising, they will reach $677 million, two-and-a-half times as much.

**Figure 18. Cost of drugs and medical supplies by group of conditions
and coverage, 2000 and 2015 (million U.S. dollars)**

Antenatal care	532.1 / 783.2 / 823.4
Normal delivery	179.6 / 319.5 / 335.6
Major complications	174.8 / 438.7 / 461.8
Prolonged labor	19.9 / 49.3 / 51.9
Operative delivery	26.5 / 63.3 / 66.7
Caesarian section	51.8 / 126.1 / 132.8
Other complications	11.3 / 26.9 / 28.3
STIs and PID	8.3 / 24.4 / 25.7
Newborn infections	3.5 / 9.0 / 9.5

Legend:
- For actual coverage in 2000
- For 95% coverage in 2015
- For 100% coverage in 2015
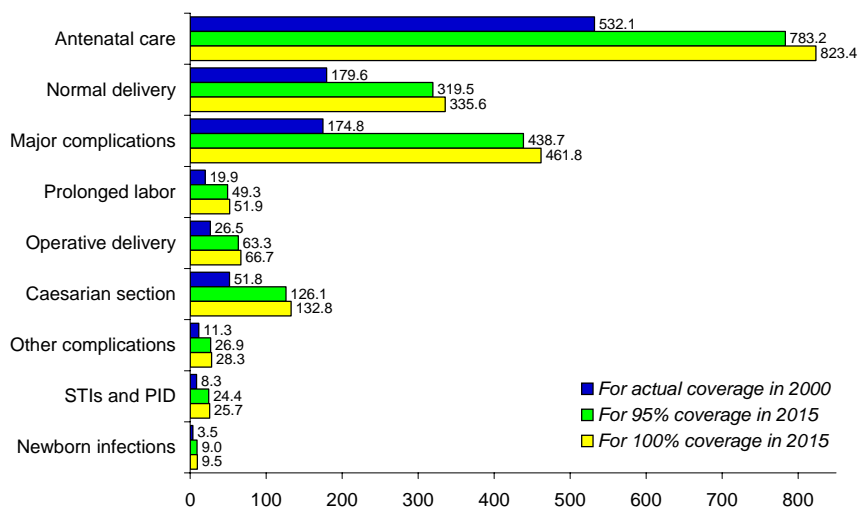
(Some breakdown appears in Figure 18 and more detail in Annex C.) The condition leading to the largest commodity cost—30 per cent of the total—is maternal haemorrhage, particularly because of the need for blood for transfusions.

Other complications. Commodity costs for all the preceding conditions make up 98 per cent of all the reproductive health commodity costs we consider. Yet, the remaining conditions may be important to attend to. Some may involve only hundreds of thousands of new cases each year, but the cumulative toll could still be heavy and the suffering that could be alleviated must be a consideration. Others of the remaining conditions do involve hundreds of millions of cases. That the commodities needed for these conditions are relatively cheap may make the case even stronger for focusing on them.

For the three additional complications we consider here, good epidemiological data are missing, and our estimates are quite rough. Urinary tract infections are probably the most common, involving 31 million women in 2000, followed by mastitis, which affected 18 million women, and obstetric fistula, a problem for 70 thousand women. As is true for most of the conditions considered earlier, we expect only a slight increase in the number of cases, by about 4 per cent by 2015. Services will have to expand to meet a 95 per cent coverage target, however, and the number covered will have to more than double. Costs of commodities for these conditions, by 2015, are projected at $9.1 million for urinary tract infection, $16.9 million for mastitis, and $890,000 for fistula. Note that the last figure covers only new cases of fistula. Dealing with previous, untreated cases would have commodity costs, over whatever period would be necessary for this, of about $25 million.

Sexually transmitted infections. The four major infections (excluding HIV, which is treated separately) affect large numbers of people. There are more than twice as many infections with STIs as there are pregnancies every year, and by 2015 the ratio should be close to 3 to 1. This is not surprising because we count both female and male cases. Applying WHO estimates for 1999 to U.N. demographic data for 2000, we estimate that there were, in 2000 in developing regions, 158 million new cases of trichomoniasis, 85 million new cases of chlamydia, 61 million new cases of gonorrhea, and 12 million new cases of syphilis. These infections are increasing much faster than the other conditions, and should each be about 30 per cent more numerous in 2015 than in 2000. If we assume that about 40 per cent of cases now receive treatment, services will have to triple by 2015 to meet a 95 per cent target.

A major problem in dealing with these infections is whom to treat. Many will be asymptomatic and will not come in voluntarily. The laboratory facilities to verify infection in those who do come in may not be available. We do not have a solution to these issues. Instead, we ignore older cases and focus only on the commodity costs for treating the new cases we estimate will emerge each year, assuming that public health services will find ways to identify those requiring treatment. With these assumptions, the commodity costs are relatively modest: $15.2 million in 2015 for the four infections, which is however a substantial increase from what we estimate as the commodity expenditure in 2000 of $5.2 million.

We also cover pelvic inflammatory disease, which can be a sequel of sexually transmitted infections. Cases should rise from 16.0 million cases in 2000 to 20.7 million in 2015, and the commodity costs would reach $9.3 million in that year.

Newborn infections. Sexually transmitted infections lead to some newborn infections that we also address. Ophthalmia neonatorum is a risk to the baby if the mother has (possibly undiagnosed) gonorrhea or chlamydia. A simple preventive measure is recommended for all babies, so we estimate the number of cases as equal to the number of births. Prevention of mother-to-child transmission of HIV is needed in only a fraction of births, numbering 2.3-2.6 million a year. Congenital syphilis involves 580,000-640,000 cases a year. We also consider neonatal sepsis, with 590,000-660,000 cases a year. These conditions combined (leaving out ophthalmia neonatorum) involve about 3 per cent of all births.

Commodity costs of the interventions are modest. By 2015, they will range from $1.1 million for congenital syphilis to $3.9 million to prevent ophthalmia neonatorum. The cost of preventing vertical HIV transmission, which is intermediate at $2.6 million, may however be misleading. We assume one dose of nevirapine for mother and infant, which would cost $1.04 per case. Because of the risk that the mother may develop resistance to the drug, limiting future treatment options, this regimen is losing favour. In 2004, WHO updated its recommendation to include zidovudine or AZT, raising the cost to $41.96 per case. With this regimen instead (and assuming of course that drug costs do not change), total costs by 2015 would equal $104 million. This would be the highest cost by far in this category and make up 5.7 per cent of all commodity costs for drugs and medical supplies in 2015.

Regional variation

Of births in developing regions in 2000, about 20 per cent each were in sub-Saharan Africa, India, and Other Asia and Pacific, 15 per cent in China, 10 per cent each in the Middle East Crescent and Latin America and the Caribbean, and 3 per cent in Eastern Europe. This distribution does not parallel the distribution of populations: sub-Saharan Africa, in particular, has a substantially greater share of births than its share of population, whereas China and Eastern Europe have a smaller share of births than population. The distribution of births does, however, suggest the distribution of the majority of reproductive health conditions requiring health services.

Antenatal care and deliveries have, of course, the same regional distribution as births. Minor complications have the same distribution by fiat, because, lacking regional data, we apply constant proportions in calculating them (Annex C). But major obstetric complications, for which we do use separate regional estimates from WHO, also, in aggregate, have a similar regional distribution. For specific complications, the only notable deviations from the overall regional distribution involve post-abortion complications, proportionally more common than births in Latin America and the Caribbean and less common in China, and hypertensive disorders, proportionally less common in Eastern Europe.

Some reproductive health conditions are indeed distributed differently across regions than births. These are mainly infectious diseases (Figure 19). Among sexually transmitted infections, sub-Saharan Africa and Latin America and the Caribbean have notably greater shares of cases of syphilis than indicated by their shares of births or population. Eastern Europe appears to have greater shares of cases of

Figure 19. Percent distributions across regions of demographic factors and selected conditions, 2000
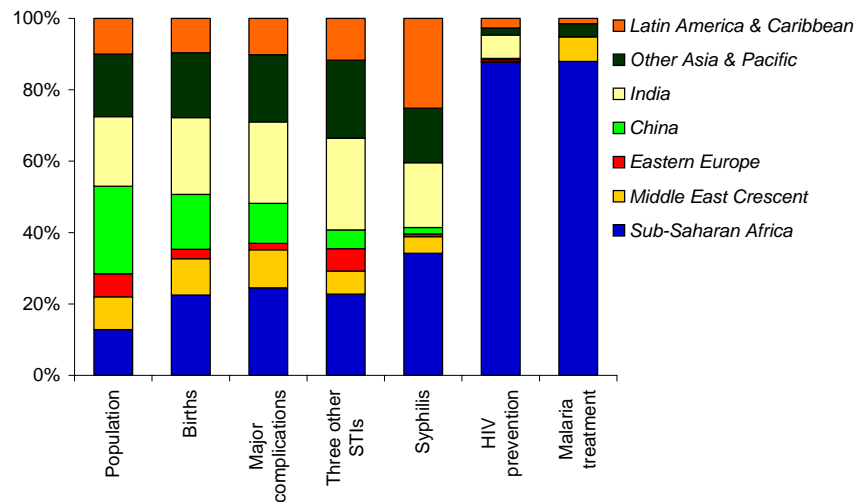
trichomoniasis, chlamydia, and gonorrhea than its share of births, but these shares are proportional to their shares of population. In contrast, China has particularly low shares of all sexually transmitted infections, and the Middle East Crescent has relatively low shares.

Where the need to protect against mother-to-child transmission of HIV is concerned, almost 9 out of 10 cases are in sub-Saharan Africa, and the same holds true for treatment of malaria. Note that this does not mean that 90 per cent of cases of HIV and malaria are in this region. The proportions are so high partly because we count infections only among pregnant women, who are more numerous in this region than elsewhere.

From 2000 to 2015, cases of many reproductive health conditions are estimated to increase fastest in sub-Saharan Africa and the Middle East Crescent. Births will be increasing only in these regions, by 21 per cent in sub-Saharan Africa and by 13 per cent in the Middle East Crescent. In the other regions, births will fall by 2-6 per cent, but cases will still increase overall in Other Asia and Pacific, India, and Latin America and the Caribbean—though by much less than in Africa and the Middle East. A small decrease in cases overall is expected in China, and a larger decrease in Eastern Europe.

This is illustrated in Figure 20, which also shows exceptions. Four of the five major obstetric complications show the general pattern, with increases only in two regions. However, increases for post-abortion complications are expected to occur more broadly, excluding only Eastern Europe and, marginally, China. Increases in post-abortion complications should parallel those for sexually transmitted infections, which should increase or decrease by about the same percentages per region. These increases will be larger than increases in births. With populations growing 20 per cent across all regions combined, sexually transmitted infections will rise 20 per cent or more in five out of seven regions.

The distribution of total commodity costs across regions resembles the distribution of births. (Since the commodity costs to treat sexually transmitted infections are around 1 per cent of total commodity costs, they have little effect on the cost distribution.) Unlike births or total cases, however, commodity costs must rise much more quickly in order to reach a 95 per cent coverage target (Figure 21). Between 2000 and 2015, annual costs requirements increase 133 per cent in sub-Saharan Africa, 107 per cent in India, 97 per cent in Other Asia and Pacific, 73 per cent in the Middle East Crescent, 42 per cent

**Figure 20. Percent change in cases of major obstetric complications
and sexually transmitted infections by region, 2000-2015 (millions)**
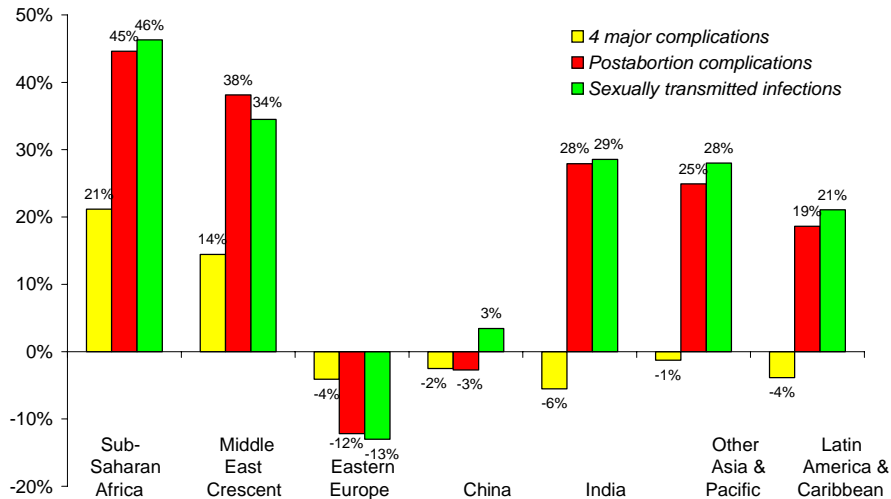
in China, and 22 per cent in Latin America and the Caribbean. Only in Eastern Europe will a trivial increase of 4 per cent suffice.

Even at current low coverage levels, the total cost of drugs and medical supplies was already higher, at $244 million, in sub-Saharan Africa than in any other region. By 2015, total costs in sub-Saharan Africa will be more than 70 per cent higher than in the next highest region. Estimates of costs for five-year periods show a similar disproportion (Figure 22). For 2011-2015, drugs and other medical supplies will cost $2.6 billion for sub-Saharan Africa, in contrast to $1.5 billion each in India and Other Asia and Pacific.

Another way to look at commodity costs is in relation to the entire population. Reproductive health commodity costs were 19 cents per capita for all developing regions in 2000, and will rise to 29

**Figure 21. Total cost of drugs and medical supplies by region, 2000
and 2015 (million U.S. dollars)**
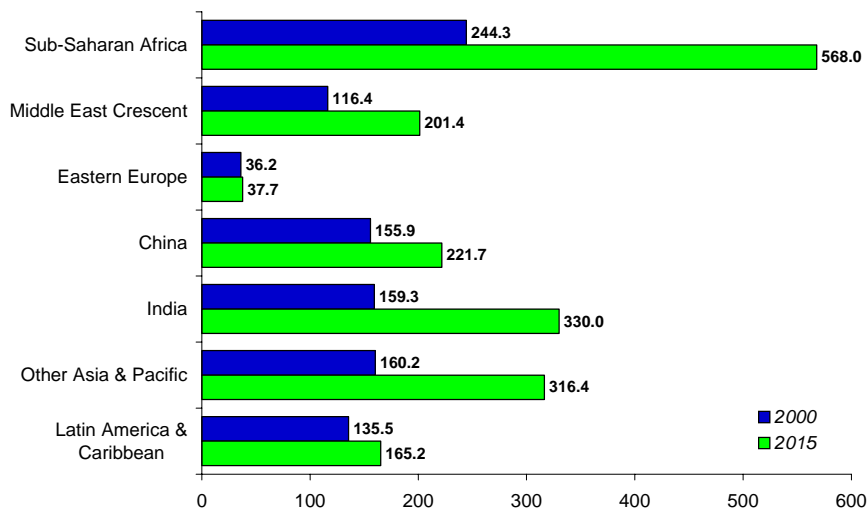
Figure 22. Cost of drugs and medical supplies by region for five-year periods, 2000-2015 (million U.S. dollars)
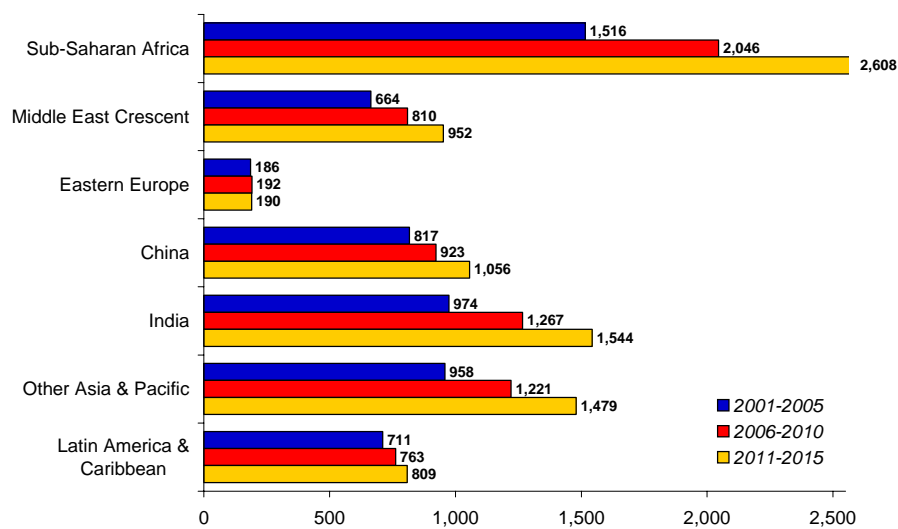
cents per capita by 2015. Across regions, the per capita costs varied widely in 2000 and will vary even more by 2015. In 2000, per capita cost ranged from 11 to 12 cents in Eastern Europe and China, up 36 cents in sub-Saharan Africa. By 2015, per capita costs will still be 12 cents in Eastern Europe but will reach 61 cents in sub-Saharan Africa, an indication of the societal burden of the delayed fertility transition.

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CONCLUSION

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The commodity costs estimated in this report have two important characteristics:

- They are substantial, at $2.34 billion in the year 2005, for instance, for all the components reviewed.

- They are growing rapidly in the aggregate, reaching $3.43 billion by 2015.

Costs are high and growing even though we have not specifically provided for such factors as wastage and inflation.

Of the three components of commodity cost that we have estimated separately—contraceptives, condoms to protect against HIV, and drugs and medical supplies for other reproductive health services—contraceptive costs are rising slowest (Figure 23). Over the 15-year period, the increase in real terms will be 31 per cent. Costs for drugs and medical supplies for other reproductive health services will increase 83 per cent in this period. And costs for condoms for protection against HIV/AIDS will increase almost 700 per cent. As noted above, the increases will be only partly due to increases in the need for services. A more important factor is current low levels of service coverage. Raising coverage in order to meet desired targets, such as 95 per cent coverage of all medical conditions, implies a substantial expansion of services. Because of past efforts, future cost growth will be more moderate for family planning and a greater challenge for other services.

Total costs for five-year periods are shown in Figure 24. These estimates rise from $10.7 billion for 2001-2005 to $16.0 billion for 2011-2015. It is useful to note that the estimated spending in 2000 (based on the rules for determining costs laid out here rather than on empirical investigation) was $1.84

Figure 23. Annual cost of commodities in developing regions, 2000-2015 (million U.S. dollars)
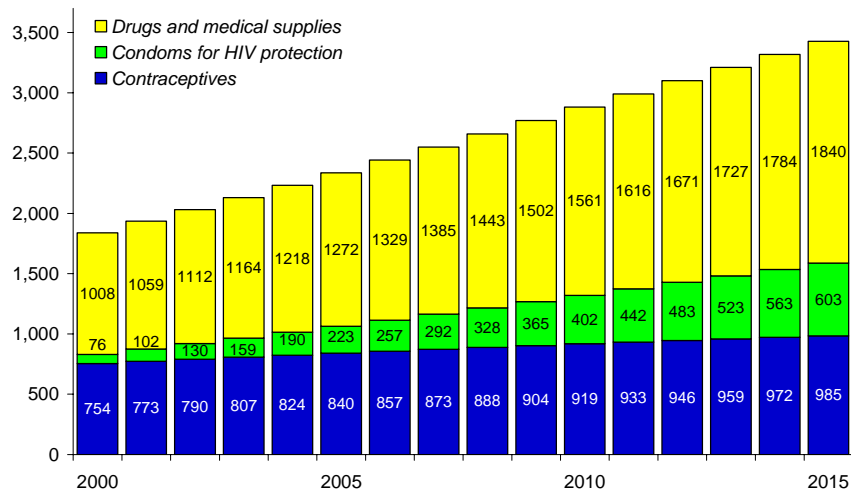
billion. If this spending can be assumed to continue—which is far from being guaranteed—the additional amounts that would have to be spent on commodities would not appear as daunting: $1.47 billion for 2001-2005, $4.11 billion for 2006-2010, and $6.86 billion for 2011-2015. A large component of the task of funding contraceptives, condoms, and other reproductive health commodities, therefore, is ensuring that the funds that have been available continue to be available in the future, but substantial increases will also have to be sought.

What proportion of current funding comes from international donors? It is not possible to tell, though there are hints that the proportion is declining, which may make it more difficult to meet the cost requirements in the future. It is not possible to tell because, though information is available on resource flows in population activities (UNFPA 2003), funding for drugs and medical supplies for reproductive health is not specified. Only funding for contraceptives and condoms for HIV protection is distinguished, and this does not cover commodities for sterilization, though it does include funding for minor methods that we do not cover here (UNFPA 2004). The comparisons we can make between donor funding and cost

Figure 24. Cost of commodities in developing regions for five-year periods (million U.S. dollars)
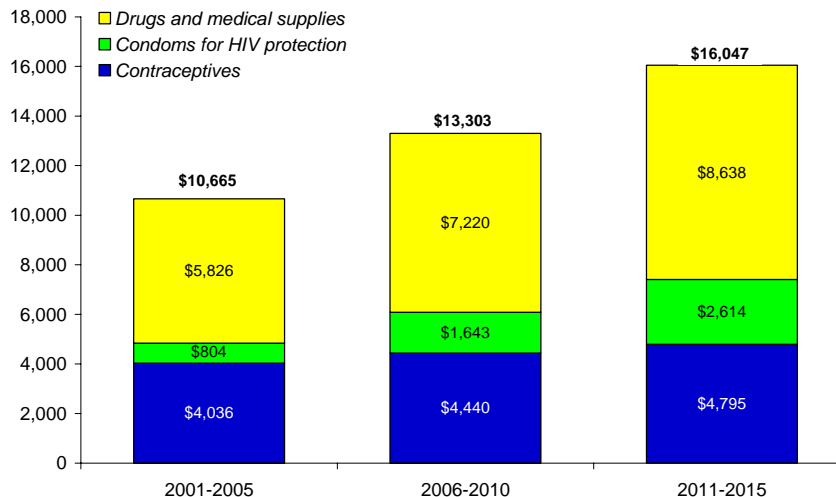
Figure 25. Cost of commodities by region for five-year periods, 2000-2015 (million U.S. dollars)
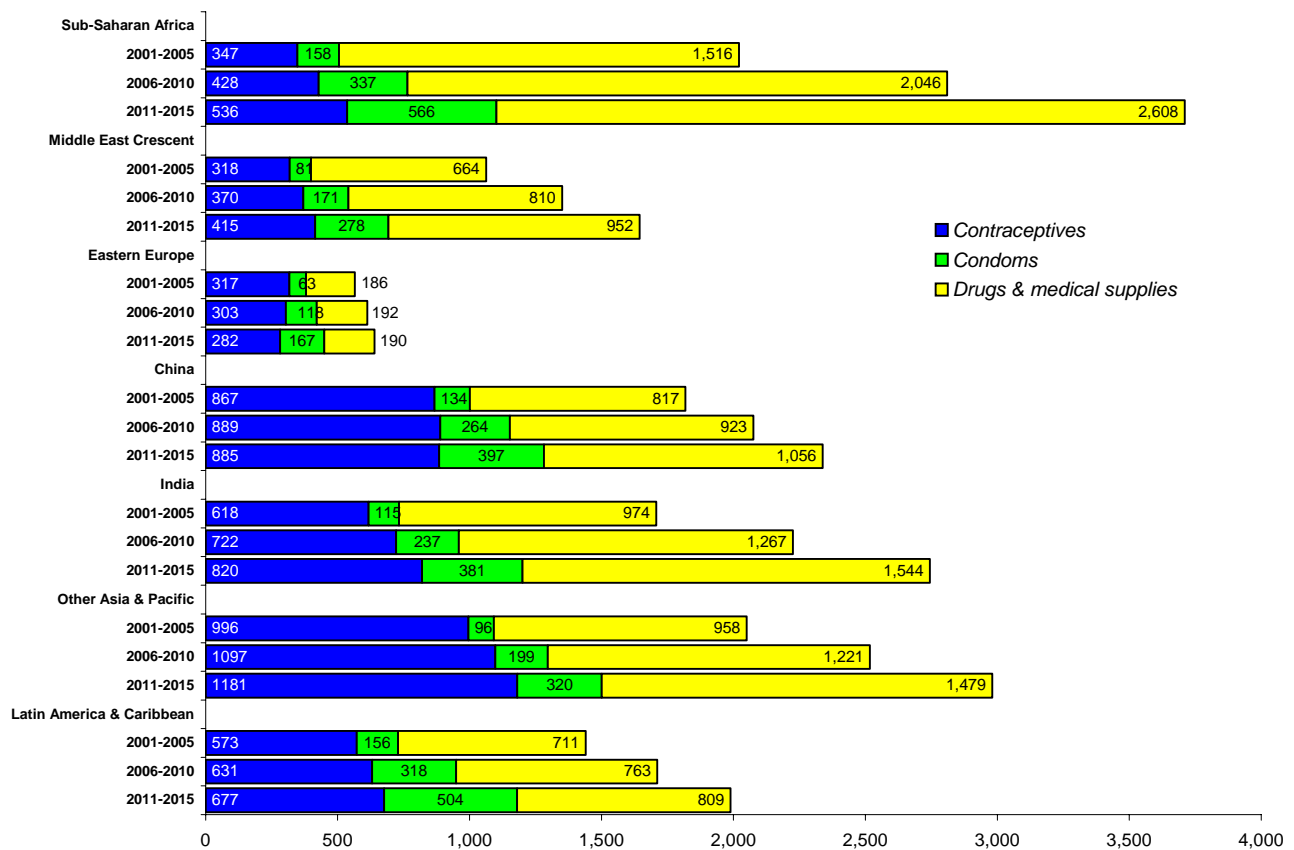
requirements are limited to four contraceptive methods: IUDs, pills, injectables, and condoms (for contraception and HIV protection combined). Donor funding for these four methods averaged $184 million annually for 2000-2004, as contrasted with the funding requirement of $5444 million annually. For these methods, therefore, donors probably covered about one third of the commodity cost.

Donors provided 41 per cent of total contraceptive requirements in 1992-1996, but less than that in the late 1990s (UNFPA 2004), suggesting possible decline in the donor share of financing. The comparisons are problematic, however. Not only is sterilization left out, but condom requirements for HIV protection may not have been properly taken into account over the years.

International donors are, however, heavily invested in helping sub-Saharan Africa. They directed 54 per cent of their 2004 funding for contraceptives and condoms to this region. This funding of $105 million was about equal to the regional requirement, which was $110 million, or slightly less if sterilization is excluded. However, this does not cover other reproductive health commodities, and cost requirements generally will rise fastest in this region.

In 2000, sub-Saharan Africa was intermediate among the regions where total commodity cost requirements are concerned. In 2004, it began to have the highest cost requirements. The other developing regions also show rising cost requirements, though the rise will be small in Eastern Europe (Figure 25). Notably, the cost of contraceptives is roughly half of the total commodity costs in Eastern Europe but under 20 per cent of the total in sub-Saharan Africa, pointing to some of the health risks, and ensuing costs, from low contraceptive use and consequent higher fertility. If more can be usefully spent on contraceptives, it reduces the commodity costs for other reproductive health interventions.

The provision of the commodities whose costs we have estimated should be accompanied by the provision of complementary inputs. Failure to coordinate different inputs is not merely a source of potential wastage. There can also be risks in providing commodities without, say, appropriate training. For instance, the frequency of use of oxytocics during normal labour, when they are not needed, reported as 4-22 per cent in health facilities in four districts across West Africa, substantially increases the need for neonatal resuscitation and doubles the relative risk of stillbirth (Dujardin et al. 1995).

No credible, detailed numbers yet exist of the costs of the complementary inputs. Assume that commodity costs make up 15 per cent of total service costs. (Tsui, Wasserheit, and Haaga [1997:291] indicate that drugs, vaccines, and disposables are 14.6 per cent of the costs of a reproductive health package focusing on pregnancy, delivery and the post-partum period.) That would imply that total reproductive health service costs in developing regions were about $12 billion in 2000 and are rising toward $23 billion by 2015.

Annexes

A. Projecting contraceptive costs

B. Projecting condom requirements for protection against HIV

C. Projecting drugs and medical supplies for reproductive health

D. Consumables in the treatment of reproductive health conditions

ANNEX A. PROJECTING CONTRACEPTIVE COSTS

This annex provides further information about the methodology to project contraceptive costs, as well as detailed results to complement those in the main report. Tables are provided on contraceptive users, commodities, and costs broken down by region, contraceptive method, and year.

Methodology

The approach to projecting contraceptive costs follows previous methodology (Mauldin and Miller 1994, Bulatao 1999), though some input data and conversion factors have been updated. As with previous exercises, the approach gives estimates of the cost of supplying contraceptives to all those likely to use them.

Likely contraceptive users per country are assumed to include all women of reproductive age (15-49 years), taken from the United Nations (2003) Population Division projections. This group is divided into the married and the unmarried, using estimates of proportions married at all ages derived from censuses and surveys or, in the absence of country data, taken to be the regional average. Proportion married is assumed constant over time.

Contraceptive prevalence in 2000, for married women, is either taken from relatively recent surveys or set at the regional average. For unmarried women, some survey estimates are also available. Where no estimates exist, the average regional ratio of unmarried to married prevalence is used to calculate prevalence among the unmarried. The future trend in contraceptive prevalence is estimated from projected total fertility rates, also from United Nations (2003). A cross-national regression of contraceptive prevalence on total fertility, using data from 273 national surveys from 101 countries, is used to estimate a slope, which is applied separately for each country.

The initial distribution of contraceptive users by method is based on the same surveys that provide contraceptive prevalence estimates. To provide a model for trend in method mix, we regress the share of each method on contraceptive prevalence level. These regressions were run separately for Muslim and non-Muslim countries, given initial indications of different patterns. The estimated equations were applied by country, with some exceptions. Method mix was kept constant for India and Indonesia, because of their distinctive patterns, as well as in each country where prevalence already exceeds 65 per cent among married women of reproductive age.

The commodities required for users of each method and their costs are shown in Table A1. Costs are weighted averages of prices paid by UNFPA and USAID, with weights representing their shares of commodities they both supply.

Detailed results

The tables that follow provide results for seven regions. The final table (Table A5) restates the cost estimates according to the four-region classification that UNFPA uses for organizational purposes. The UNFPA classification groups China and India with the rest of Asia and the Pacific and also adds to this region some non-Arab Middle Eastern countries, and moves some sub-Saharan countries into a region embracing Arab countries, Eastern Europe, and Central Asia.

When appropriate regions are matched, the cost results are virtually the same. Costs for UNFPA/Latin America are identical to those for Latin America and the Caribbean. Costs for UNFPA/Africa are about 2.4 per cent below those for sub-Saharan Africa. Costs for UNFPA/Asia Pacific correspond to the combination of China, India, and Other Asia and Pacific, being no more than 3.4 per cent higher. These differences are small relative to the likely imprecision of cost projections.

For the last UNFPA region, results do contrast somewhat more. UNFPA/Arab States/Eastern Europe, if compared with the combination of the Middle East Crescent and Eastern Europe, has costs 12 per cent lower. The difference is mainly due to non-Arab Middle Eastern countries, which we include in the Middle East Crescent but which are excluded from the UNFPA region.

Table A1. Individual contraceptive requirements and prices

Method	Units required for one couple-year of protection [a]	Price per unit (U.S. dollars) [b]	Cost per couple-year of protection [c]
Female sterilization	1/9	$9.09	$1.01
Male sterilization	1/9	$4.95	$0.55
IUDs	1/3.5	$0.576	$0.16
Pills	15	$0.24	$3.60
Injectables	4	$0.965	$3.86
Condoms	120	$0.035	$4.20

a Sterilization, though its effect is permanent, is assumed to provide only nine years of protection because many are not sterilized until late in their reproductive careers.
b Prices are weighted averages of those normally paid by UNFPA and USAID, with weights reflecting respective shares of commodities they supply.
c Calculated from preceding columns.

Table A2. Contraceptive users by region, 2000-2015 (millions)

Method and year	All developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
All methods								
2000	571.0	28.3	40.7	43.8	211.6	94.2	87.9	64.6
2001	583.4	29.8	42.2	43.8	213.2	97.6	90.5	66.2
2002	595.6	31.4	43.7	43.8	214.7	101.2	93.1	67.7
2003	607.8	33.0	45.2	43.6	216.2	104.8	95.8	69.3
2004	619.9	34.6	46.8	43.4	217.5	108.4	98.4	70.8
2005	632.0	36.3	48.3	43.2	218.8	112.1	101.0	72.3
2006	643.5	38.3	49.8	42.8	219.9	115.5	103.5	73.7
2007	654.9	40.4	51.2	42.3	221.0	119.0	106.0	75.1
2008	666.1	42.6	52.6	41.7	221.8	122.5	108.4	76.4
2009	676.9	44.9	54.0	41.1	222.4	126.0	110.7	77.8
2010	687.3	47.2	55.4	40.5	222.6	129.5	113.1	79.0
2011	696.8	49.9	56.6	39.9	222.4	132.8	115.1	80.1
2012	705.9	52.6	57.8	39.3	221.9	136.0	117.1	81.1
2013	714.6	55.5	59.0	38.7	221.1	139.2	119.0	82.1
2014	722.9	58.5	60.2	38.1	219.7	142.3	120.9	83.0
2015	730.9	61.7	61.5	37.6	217.9	145.5	122.8	83.9
Female sterilization								
2000	215.0	2.9	3.3	10.8	88.6	67.2	15.0	27.3
2005	238.4	4.1	4.5	10.9	91.6	80.0	17.0	30.4
2010	259.4	6.2	5.6	10.2	93.2	92.4	18.7	33.1
2015	275.7	9.6	6.6	9.5	91.3	103.8	20.0	34.9
Male sterilization								
2000	34.5	0.2	0.2	1.3	25.3	3.7	2.2	1.5
2005	36.4	0.3	0.3	1.4	26.1	4.5	2.3	1.7
2010	37.9	0.4	0.3	1.3	26.6	5.1	2.3	1.9
2015	38.3	0.5	0.4	1.2	26.0	5.8	2.4	2.1
IUDs								
2000	129.9	1.7	13.8	9.0	83.4	3.2	11.8	7.0
2005	139.8	2.4	15.5	8.8	86.2	3.8	15.1	8.0
2010	148.1	3.6	16.7	8.3	87.7	4.3	18.6	8.9
2015	152.9	5.4	17.7	7.7	85.9	4.9	21.7	9.6
Pills								
2000	66.5	6.4	9.5	5.5	7.8	4.1	20.2	13.1
2005	75.4	8.1	11.2	5.5	8.0	4.9	23.1	14.6
2010	83.7	10.7	12.5	5.1	8.2	5.7	25.7	15.8
2015	90.9	14.3	13.3	4.8	8.0	6.4	27.6	16.6
Injectables								
2000	30.8	7.0	1.0	1.2	0.5	0.0	17.8	3.2
2005	34.3	8.0	1.6	1.3	0.5	0.0	19.4	3.6
2010	37.4	9.1	2.0	1.2	0.5	0.0	20.7	3.9
2015	40.3	10.3	2.5	1.1	0.5	0.0	21.8	4.1
Condoms								
2000	33.0	1.9	2.8	6.3	5.4	6.1	6.1	4.3
2005	36.3	2.4	3.3	6.0	5.6	7.3	6.9	4.8
2010	39.5	3.0	4.0	5.6	5.7	8.4	7.5	5.4
2015	42.2	3.6	4.6	5.2	5.6	9.4	8.0	5.8
Other methods (mainly traditional)								
2000	61.3	8.2	10.1	9.7	0.6	9.9	14.6	8.2
2005	71.2	11.0	11.9	9.4	0.6	11.7	17.3	9.2
2010	81.4	14.3	14.4	8.8	0.6	13.5	19.6	10.1
2015	90.7	18.0	16.5	8.2	0.6	15.2	21.4	10.7

Table A3. Contraceptive commodities required by region, 2000-2015

Method and year	All developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
Female sterilization (millions of procedures)								
2000	23.9	0.3	0.4	1.2	9.8	7.5	1.7	3.0
2001-2005	127.4	2.0	2.3	6.1	50.3	41.5	9.0	16.2
2006-2010	139.5	2.9	2.9	5.8	51.5	48.6	10.0	17.8
2011-2015	149.7	4.5	3.4	5.4	51.3	55.1	10.8	19.0
Male sterilization (millions of procedures)								
2000	3.8	0.0	0.0	0.1	2.8	0.4	0.2	0.2
2001-2005	19.8	0.1	0.1	0.8	14.3	2.3	1.3	0.9
2006-2010	20.8	0.2	0.2	0.7	14.7	2.7	1.3	1.0
2011-2015	21.2	0.3	0.2	0.7	14.6	3.1	1.3	1.1
IUDs (millions)								
2000	37.1	0.5	3.9	2.6	23.8	0.9	3.4	2.0
2001-2005	194.1	3.0	21.2	12.7	121.7	5.0	19.6	10.8
2006-2010	207.1	4.4	23.2	12.2	124.8	5.9	24.6	12.2
2011-2015	216.0	6.6	24.7	11.3	124.3	6.7	29.2	13.3
Pills (millions of cycles)								
2000	998.2	95.3	143.1	82.3	116.4	62.1	302.8	196.3
2001-2005	5,403.6	552.8	803.4	413.3	594.4	345.3	1,645.4	1,049.0
2006-2010	6,031.4	720.8	901.5	395.9	609.1	403.7	1,850.9	1,149.5
2011-2015	6,604.8	960.4	973.6	368.9	606.2	458.5	2,014.0	1,223.3
Injectables (millions of injections)								
2000	123.1	28.0	4.1	4.8	2.0	0.0	71.3	12.7
2001-2005	661.3	152.5	27.9	25.3	10.3	0.0	376.1	69.2
2006-2010	723.7	173.1	36.5	24.2	10.6	0.0	403.0	76.3
2011-2015	783.5	196.0	45.3	22.6	10.5	0.0	427.7	81.3
Condoms (millions)								
2000	3,955.1	230.5	335.0	754.3	650.5	732.8	737.5	514.5
2001-2005	20,932.4	1,343.6	1,853.1	3,621.9	3,325.7	4,078.4	3,952.1	2,757.7
2006-2010	22,953.6	1,659.8	2,230.7	3,460.3	3,405.7	4,767.7	4,346.4	3,082.9
2011-2015	24,660.2	2,016.0	2,594.6	3,206.1	3,382.8	5,414.5	4,659.7	3,386.5

Table A4. Cost of contraceptive commodities and procedures by region, 2000-2015 (million U.S. dollars)

Method and year	All developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
All methods								
2000	754.3	61.3	55.7	63.9	169.8	111.0	185.7	106.9
2001	773.2	64.0	59.4	63.8	171.1	115.1	190.4	109.5
2002	790.5	66.7	61.5	63.7	172.3	119.2	194.9	112.1
2003	807.4	69.4	63.6	63.5	173.5	123.5	199.2	114.7
2004	824.0	72.1	65.7	63.2	174.6	127.7	203.5	117.2
2005	840.5	74.9	67.8	62.8	175.6	132.1	207.6	119.6
2006	856.7	78.3	69.9	62.2	176.5	136.2	211.7	121.9
2007	872.6	81.8	72.0	61.5	177.3	140.3	215.6	124.1
2008	888.3	85.5	74.1	60.7	178.0	144.4	219.4	126.3
2009	903.7	89.2	76.0	59.9	178.4	148.5	223.2	128.4
2010	918.6	93.1	77.9	59.0	178.5	152.6	226.9	130.5
2011	932.6	97.6	79.7	58.1	178.4	156.5	230.2	132.2
2012	946.1	102.2	81.3	57.2	178.0	160.2	233.3	133.8
2013	959.3	107.1	82.9	56.3	177.3	164.0	236.3	135.4
2014	972.1	112.0	84.5	55.5	176.2	167.7	239.2	136.9
2015	984.6	117.2	86.2	54.7	174.8	171.4	241.9	138.3
Female sterilization								
2000	217.1	3.0	3.3	10.9	89.5	67.8	15.1	27.5
2001-2005	1,157.9	18.0	20.7	55.5	457.0	377.6	81.9	147.3
2006-2010	1,268.5	26.4	26.1	53.1	468.5	441.4	91.2	161.7
2011-2015	1,360.8	40.9	31.3	49.4	466.6	501.3	98.5	172.8
Male sterilization								
2000	19.0	0.1	0.1	0.7	13.9	2.1	1.2	0.8
2001-2005	98.2	0.7	0.6	3.8	71.0	11.5	6.2	4.5
2006-2010	102.7	0.9	0.8	3.6	72.8	13.4	6.3	5.0
2011-2015	105.1	1.2	0.9	3.3	72.5	15.2	6.4	5.5
IUDs								
2000	21.4	0.3	2.3	1.5	13.7	0.5	1.9	1.2
2001-2005	111.8	1.7	12.2	7.3	70.1	2.9	11.3	6.2
2006-2010	119.3	2.6	13.3	7.0	71.9	3.4	14.2	7.0
2011-2015	124.4	3.8	14.2	6.5	71.6	3.8	16.8	7.7
Pills								
2000	239.6	22.9	34.4	19.7	27.9	14.9	72.7	47.1
2001-2005	1,296.9	132.7	192.8	99.2	142.6	82.9	394.9	251.8
2006-2010	1,447.5	173.0	216.3	95.0	146.2	96.9	444.2	275.9
2011-2015	1,585.2	230.5	233.7	88.5	145.5	110.0	483.4	293.6
Injectables								
2000	118.8	27.0	4.0	4.7	2.0	0.0	68.8	12.3
2001-2005	638.1	147.2	26.9	24.4	10.0	0.0	363.0	66.8
2006-2010	698.4	167.0	35.3	23.4	10.2	0.0	388.9	73.6
2011-2015	756.1	189.1	43.8	21.8	10.2	0.0	412.7	78.5
Condoms								
2000	138.4	8.1	11.7	26.4	22.8	25.6	25.8	18.0
2001-2005	732.6	47.0	64.9	126.8	116.4	142.7	138.3	96.5
2006-2010	803.4	58.1	78.1	121.1	119.2	166.9	152.1	107.9
2011-2015	863.1	70.6	90.8	112.2	118.4	189.5	163.1	118.5

Table A5. Cost of contraceptive commodities and procedures by UNFPA region, 2000-2015 (million U.S. dollars)

Method and year	All UNFPA regions	Arab States/ Europe	Africa	Asia Pacific	Latin America
All methods					
2000	754.4	105.9	60.0	481.5	106.9
2001	773.3	109.1	62.6	492.1	109.5
2002	790.5	110.7	65.2	502.5	112.1
2003	807.4	112.3	67.8	512.7	114.7
2004	824.1	113.7	70.5	522.8	117.2
2005	840.5	115.0	73.2	532.7	119.6
2006	856.7	116.1	76.4	542.3	121.9
2007	872.7	117.1	79.9	551.6	124.1
2008	888.3	118.0	83.4	560.6	126.3
2009	903.7	118.9	87.1	569.4	128.4
2010	918.6	119.6	90.9	577.7	130.5
2011	932.7	120.2	95.3	585.0	132.2
2012	946.2	120.8	99.8	591.8	133.8
2013	959.4	121.4	104.5	598.1	135.4
2014	972.2	122.0	109.4	603.9	136.9
2015	984.6	122.7	114.5	609.2	138.3
Female sterilization					
2000	217.2	12.8	2.9	173.9	27.5
2001-2005	1,158.0	69.0	17.5	924.2	147.3
2006-2010	1,268.5	71.0	25.8	1,010.1	161.7
2011-2015	1,360.9	71.8	40.2	1,076.2	172.8
Male sterilization					
2000	19.0	0.8	0.1	17.3	0.8
2001-2005	98.2	3.9	0.7	89.1	4.5
2006-2010	102.7	3.9	0.9	93.0	5.0
2011-2015	105.1	3.7	1.2	94.7	5.5
IUDs					
2000	21.4	3.6	0.3	16.4	1.2
2001-2005	111.8	18.8	1.7	85.1	6.2
2006-2010	119.3	19.5	2.5	90.4	7.0
2011-2015	124.4	19.8	3.7	93.3	7.7
Pills					
2000	239.6	45.4	21.6	125.4	47.1
2001-2005	1,297.0	245.2	125.6	674.5	251.8
2006-2010	1,447.7	259.1	164.4	748.3	275.9
2011-2015	1,585.3	266.2	220.2	805.2	293.6
Injectables					
2000	118.8	8.7	27.0	70.8	12.3
2001-2005	638.2	51.6	146.9	372.9	66.8
2006-2010	698.4	59.1	166.5	399.2	73.6
2011-2015	756.1	66.2	188.3	423.2	78.5
Condoms					
2000	138.4	34.6	8.1	77.8	18.0
2001-2005	732.7	172.5	46.9	416.9	96.5
2006-2010	803.5	177.3	57.7	460.6	107.9
2011-2015	863.2	179.4	69.8	495.5	118.5

ANNEX B. PROJECTING CONDOM REQUIREMENTS FOR PROTECTION AGAINST HIV

Different approaches have been used to estimate condom requirements for protection against HIV. This annex reviews the main issues, formulates answers that allow an update of the UNFPA (2002) estimates, and provides tabular results, with no discussion, for which see the main report.

Methodological issues

What countries or regions should be covered? Some previous estimates cover only specific regions most affected by the epidemic, such as sub-Saharan Africa (Shelton and Johnson 2001). Others are global, including even industrial countries (Gardner, Blackburn, and Upadhyay 1999). We focus on all developing regions, as in the contraceptive projections, with the understanding that the HIV epidemic is not narrowly contained but a worldwide threat. An additional consideration is that we wish to provide some protection against other sexually transmitted infections, which are not geographically delimited either.

What should be the base population? One possible answer is sexually active men, who may possibly transmit the virus through sex or become infected themselves. Some calculations focus in addition on commercial sex workers, a high-risk population harder to estimate that plays a key role in the epidemic. Since patrons of commercial sex workers are presumably a selection from among sexually active men, we do not give them a special focus in these projections (though in any prevention program they would indeed be worth special attention). We focus here on males aged 15-59 years.

How often would this population require condoms? The basic assumption is that condoms are required for all instances of risky sex: commercial sex, casual sex among occasional partners, sex between males, even some instances of marital sex or sex between regular partners. Marital sex could pose a threat if one partner has non-marital contacts, though condom use in such circumstances might raise the suspicions of one's partner.

A summary of data on the frequency of such incidents of risky sex has been provided by Stover (2005) as part of a UNAIDS review, ongoing at this writing, of resource needs in responding to AIDS in low and middle income countries. Calculations of incidents, provided for the years 2005-2007, give rates for risky sex (calculated using population data from United Nations 2003) that are essentially constant in each developing country covered.

Across 134 developing countries, the population-weighted mean incidence of risky sex per male is 14.8

episodes per year, the unweighted mean is 15.0, and the median is 18.8. Table B1 shows indicators of the distribution of this statistic by region. (These estimates, which are meant to be equivalent to the number of condoms required, may allow for 10 per cent wastage.)

In the aggregate, these estimates are roughly in the range of estimates previously used in estimating condom requirements. For instance, Ross et al. (2000) set 2015 goals of 25 condoms per man-year in countries with high HIV prevalence, and 15 per man-year in countries with low prevalence. Shelton and Johnston (2001) report a requirement of 16.9 condoms per man-year in sub-Saharan Africa, including condoms for contraception. This is based on actual numbers supplied, by donors and local sources, in the six countries with the highest per capita supply. UNFPA (2004a) does not use such simple averages, but the numbers used are consistent with rates of 15 per man-year in high HIV prevalence countries and 10 per man-year elsewhere.

We apply Stover's estimates of risky sex incidents per man-year to the male population in each country. Regional averages are used for a few small countries without data (Table B2). Risky marital contacts, in Stover's estimates, are a variable proportion of the total across countries but are constant for each country (for the years 2005-2007), ranging from 17 to 72 per cent of the total. Using these country proportions, we distinguish marital and non-marital risky sex in the table. The figures in Table B2 also represent condoms required for protection for all risky sex. Actual condom use is substantially lower, and estimating how coverage should rise is problematic.

What proportion of the requirement should one expect to cover? A range of targets could be considered: complete coverage of all risky sex acts; just that level sufficient to effectively arrest the HIV epidemic; a higher level that also takes into account quantity of condoms needed for an effective campaign to achieve such usage; or possibly the broader coverage needed for additional protection against other sexually transmitted infections. Except for complete coverage, none of these targets is readily translated into actual percentages.

Previous attempts to produce estimates, therefore, either assume complete coverage (Gardner, Blackburn, and Upadhyay 1999) or arbitrarily adopt some target percentage. Stover (2005) suggests a complex system of coverage targets for the year 2007, depending on whether a country has HIV prevalence under 0.5 per cent, under 1 per cent, under 5 per cent, or over 5 per cent. For each group of countries in order, the goal for 2007 would be coverage of 60, 70, 80, or 80 per cent of commercial sex and sex between males; 20, 40, 60, or 60 per cent for casual sex; and 10, 10, 20, or 30 per cent

for marital sex where one partner is extramaritally active. These targeted levels are meant to take into account the limited reach of condom promotion interventions as well as the likelihood that more severe HIV epidemics lead to wider condom use.

Given the complexity of these targets and the fact that condoms should be promoted for protection against other sexually transmitted infections as well, we adopt a simpler approach. We follow the target suggested in UNFPA (2002): 80 per cent coverage by 2015 of all risky sex acts. For risky marital sex, however, we adopt a lower target of 30 per cent by 2015. This recognizes several realities. Widespread condom protection within marriage would interfere with desired conceptions, would be difficult to achieve, and though essential for individual protection is less essential for epidemic control than protection in casual sex.

The 2002 UNFPA report also assumed that initial coverage (in 2000) is 50 per cent. One limited piece of evidence pointing in this direction concerns sexual behaviour among those aged 15-24 years. In surveys in 27 sub-Saharan countries around 2000, those who report having engaged in higher-risk sex in the previous year were asked if they had used condoms in the latest incident. Only 27 per cent of the females said yes, but of the males, who tend to be more accurate for this male method, 47 per cent said yes. There have been fewer surveys outside this region, but the results are similar. In five non-African surveys, the average positive response for males was exactly 50 per cent (UNAIDS 2004).

Estimates of condoms actually supplied in one region suggest that current coverage could be somewhat lower. Donated condoms for sub-Saharan Africa over the period 2000-2004 average 2 billion annually (UNFPA 2004), and locally provided condoms add 20 per cent more (based on an earlier estimate in Shelton and Johnston 2001). If we subtract the required 256 million for family planning, the remaining 2.1 billion represent 12 condoms per male 15-59 years old. This would be 80 per cent if the assumed full coverage level were 15 per year, though at sub-Saharan rates for risky sex it would be only about 45 per cent.

In contrast to these arguments for initial coverage of 50 per cent, Stover assumes much lower coverage. For 2005-2007, the unweighted averages of his country estimates are 17-25 per cent coverage of risky non-marital sex and 14-15 per cent coverage of risky marital sex. Population-weighted averages are 2 percentage points lower in each case. (The range across countries is 5-52 per cent for non-marital sex and 3-66 per cent for marital sex.)

We therefore adopt, arbitrarily, an intermediate position: initial coverage of 15 per cent in 2000 for risky non-marital sex and 5 per cent in 2000 for risky marital

sex, with no variation across countries. We assume linear improvements in coverage toward the goals of 80 and 30 per cent coverage by 2015. This gives coverage rates by 2003 of 28 per cent for non-marital sex and 10 per cent for marital sex by 2003, which is reportedly roughly in line with unpublished UNAIDS estimates.

Goals of 80/30 per cent coverage are lower than the 95 per cent we set as a standard for reproductive health commodities generally. This may however be more realistic in reflecting the difficulty of enforcing universal use of condoms for risky sex. In a conceptual sense, this target may be intermediate between those set for contraceptives and for other reproductive health commodities. The target partly reflects the fact that demand for condoms for protection, like the demand for family planning, is not universal, even among those for whom it may be advisable from an observer's perspective. But the target also reflects an intention to expand supply beyond what might be immediately accepted without a specific campaign.

We do consider two alternatives to the main target of 80/30 per cent coverage. A high alternative is 80 per cent coverage for both non-marital and marital sex, starting with assumed 50 per cent coverage for both in 2000. A low alternative is derived from Stover's coverage estimates for 2005 and 2007. We extrapolate backwards and forwards from the levels for each country, for non-marital and marital sex separately, with two restrictions. First, where Stover has coverage falling from 2005 to 2007, we require that it stays constant at 2005 levels, going backward, and at 2007 levels, going forward. Second, we set limits to coverage, which is not allowed to exceed 95 per cent or to fall below 5 per cent, for non-marital sex, or 2 per cent, for marital sex. The maximum is arbitrary, whereas the minima are within 1 percentage point of the lowest levels that Stover reports for 2005. With these assumptions, coverage by 2015 would average 59 per cent for non-marital sex and 24 per cent for marital sex. Note that these targets, though much lower than the alternatives we use, are still higher than those Stover himself suggests, since he assumes that coverage ceases to rise after 2010.

What types of condoms will be used? The important distinction is between male and female condoms. Female condoms have a very small share of the market. In 2004, 11.8 million female condoms were distributed through public and private sources worldwide (including in industrial countries), which pales in comparison even to just the donor-provided male condoms in developing regions, which totaled 2.1 billion (UNFPA 2004). National and international commitment, as well as greater availability and falling prices, could presumably raise usage over time.

We assume that female condoms make up 0.2 per cent of all condoms in 2003, rising to 1 per cent in 2010

and 2 per cent in 2015. We also assume that their costs fall, from $0.57 in 2003 to $0.25 in 2015. For male condoms, we use a unit cost of $0.035.

That we focus only on males in these estimates and projections does not of course mean that the concern is only with male health. Female rates of infection could in fact be more greatly affected than male rates if condom use expands.

Detailed results

The following tables, all broken down by region, provide detailed results to complement the information in the main report. The incidence of risky sex, which is also equivalent to the number of condoms required for full coverage, is reported by year for seven regions (Table B2). The numbers of condoms required for coverage of risky sex to rise to 80 per cent (non-marital) and 30 per cent (marital), from initial levels of 15 and 5 per cent respectively, are shown in Table B3. A distinction is made, in this table, between male and female condoms, with female condoms rising to 2 per cent of the total. Table B4 shows the resulting costs, and Table B5 the costs by UNFPA region.

Alternative coverage levels, as described above, give different estimates of the condoms required (Table B6) and their costs (Table B7).

Table B1. Risky sex acts per year per male 15-59: means and medians across countries and measures of distribution, by region

Indicator	All developing countries	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
Population-weighted mean	14.8	26.7	16.5	19.2	8.9	10.4	10.1	30.3
Median	18.8	28.0	17.7	17.4	8.9	10.4	10.3	24.9
Minimum	4.2	4.2	9.8	11.8	8.9	10.4	5.8	8.4
Lower quartile	16.0	17.4	17.2	16.4	8.9	10.4	9.9	22.6
Upper quartile	27.7	37.2	18.8	17.8	8.9	10.4	11.3	27.2
Maximum	54.9	54.9	22.7	39.8	8.9	10.4	35.2	48.4
No. of countries	(134)	(45)	(24)	(18)	(1)	(1)	(19)	(26)

Table B2. Incidence of risky non-marital and marital sex by region, 2000-2015 (millions of acts)

Year	Developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
All risky sex								
2000	23,580	4,548	2,434	2,024	3,830	3,217	2,790	4,738
2001	24,040	4,666	2,500	2,034	3,884	3,284	2,849	4,824
2002	24,512	4,787	2,569	2,045	3,938	3,352	2,910	4,911
2003	24,994	4,911	2,640	2,056	3,994	3,421	2,971	5,000
2004	25,487	5,039	2,713	2,067	4,050	3,492	3,035	5,091
2005	25,992	5,170	2,788	2,078	4,107	3,565	3,100	5,184
2006	26,407	5,302	2,849	2,067	4,136	3,631	3,160	5,262
2007	26,832	5,438	2,912	2,057	4,165	3,698	3,222	5,341
2008	27,266	5,578	2,976	2,046	4,194	3,767	3,284	5,421
2009	27,711	5,721	3,042	2,036	4,223	3,837	3,349	5,503
2010	28,165	5,868	3,109	2,026	4,253	3,908	3,415	5,586
2011	28,523	6,016	3,160	2,003	4,256	3,968	3,465	5,655
2012	28,889	6,168	3,211	1,980	4,259	4,029	3,516	5,725
2013	29,263	6,324	3,264	1,957	4,262	4,091	3,569	5,797
2014	29,646	6,484	3,318	1,935	4,265	4,153	3,622	5,869
2015	30,038	6,648	3,373	1,913	4,268	4,217	3,676	5,942
Non-marital sex								
2000	9,947	1,921	906	773	1,792	1,495	1,195	1,865
2001	10,140	1,970	931	777	1,817	1,526	1,220	1,899
2002	10,338	2,021	957	781	1,843	1,558	1,245	1,933
2003	10,540	2,073	983	785	1,869	1,590	1,271	1,969
2004	10,747	2,127	1,010	790	1,895	1,623	1,298	2,005
2005	10,959	2,182	1,038	794	1,922	1,657	1,325	2,041
2006	11,133	2,238	1,061	790	1,935	1,687	1,350	2,072
2007	11,311	2,295	1,084	786	1,949	1,719	1,376	2,103
2008	11,493	2,353	1,108	782	1,962	1,751	1,403	2,135
2009	11,679	2,414	1,133	778	1,976	1,783	1,430	2,167
2010	11,870	2,475	1,158	774	1,990	1,816	1,457	2,200
2011	12,019	2,537	1,177	765	1,991	1,844	1,478	2,227
2012	12,172	2,600	1,196	756	1,992	1,872	1,500	2,255
2013	12,328	2,666	1,215	747	1,994	1,901	1,522	2,283
2014	12,487	2,732	1,235	739	1,995	1,930	1,544	2,311
2015	12,651	2,801	1,256	730	1,997	1,960	1,567	2,340
Marital sex								
2000	13,633	2,628	1,527	1,250	2,038	1,722	1,595	2,873
2001	13,900	2,696	1,569	1,257	2,067	1,758	1,629	2,925
2002	14,174	2,766	1,612	1,264	2,096	1,794	1,664	2,978
2003	14,453	2,838	1,657	1,270	2,125	1,831	1,700	3,032
2004	14,740	2,912	1,702	1,277	2,155	1,869	1,737	3,087
2005	15,033	2,988	1,750	1,284	2,186	1,908	1,775	3,143
2006	15,274	3,065	1,788	1,278	2,201	1,943	1,810	3,190
2007	15,521	3,143	1,827	1,271	2,216	1,980	1,845	3,238
2008	15,773	3,224	1,868	1,265	2,232	2,016	1,882	3,286
2009	16,031	3,307	1,909	1,259	2,247	2,054	1,919	3,336
2010	16,295	3,393	1,951	1,252	2,263	2,092	1,957	3,386
2011	16,504	3,479	1,983	1,238	2,265	2,124	1,987	3,428
2012	16,717	3,567	2,016	1,224	2,266	2,156	2,016	3,471
2013	16,935	3,658	2,049	1,210	2,268	2,189	2,047	3,514
2014	17,159	3,751	2,083	1,197	2,270	2,223	2,078	3,558
2015	17,387	3,847	2,117	1,183	2,271	2,257	2,109	3,602

Note: The figures also represent the numbers of condoms required for full coverage of risky sex.

Table B3. Condoms required for rising coverage by condom type and region, 2000-2015 (millions of pieces)

Year	Developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
All condoms								
2000	2,174	419	212	179	371	310	259	423
2001	2,887	561	285	234	489	412	344	562
2002	3,628	709	361	290	611	518	433	706
2003	4,397	864	441	347	736	628	526	854
2004	5,195	1,027	525	404	864	743	622	1,008
2005	6,023	1,199	614	462	996	862	723	1,167
2006	6,856	1,377	703	515	1,123	983	825	1,328
2007	7,715	1,564	796	568	1,253	1,109	931	1,493
2008	8,600	1,760	893	620	1,384	1,239	1,042	1,663
2009	9,513	1,965	993	672	1,516	1,374	1,156	1,837
2010	10,455	2,179	1,098	723	1,651	1,513	1,274	2,017
2011	11,383	2,402	1,200	768	1,776	1,651	1,390	2,195
2012	12,334	2,634	1,305	812	1,902	1,794	1,509	2,378
2013	13,310	2,877	1,413	856	2,027	1,940	1,631	2,565
2014	14,310	3,130	1,525	898	2,153	2,090	1,757	2,757
2015	15,337	3,395	1,640	939	2,279	2,245	1,886	2,953
Male condoms								
2000	2,174	419	212	179	371	310	259	423
2001	2,885	560	284	234	489	412	344	562
2002	3,623	708	360	290	610	517	433	705
2003	4,388	863	440	346	734	627	525	853
2004	5,178	1,024	524	403	861	741	620	1,005
2005	5,997	1,193	611	460	992	858	719	1,162
2006	6,819	1,370	699	513	1,117	978	821	1,321
2007	7,664	1,554	791	564	1,244	1,102	925	1,483
2008	8,534	1,746	886	615	1,373	1,230	1,034	1,650
2009	9,429	1,947	985	666	1,503	1,362	1,146	1,821
2010	10,350	2,157	1,087	715	1,634	1,498	1,261	1,997
2011	11,246	2,373	1,186	759	1,755	1,631	1,373	2,169
2012	12,162	2,597	1,287	801	1,875	1,769	1,488	2,345
2013	13,097	2,831	1,391	842	1,995	1,909	1,605	2,524
2014	14,053	3,074	1,497	882	2,114	2,053	1,725	2,707
2015	15,030	3,327	1,607	920	2,233	2,200	1,849	2,894
Female condoms								
2000	0	0	0	0	0	0	0	0
2001	2	0	0	0	0	0	0	0
2002	5	1	0	0	1	1	1	1
2003	9	2	1	1	1	1	1	2
2004	16	3	2	1	3	2	2	3
2005	26	5	3	2	4	4	3	5
2006	37	7	4	3	6	5	4	7
2007	51	10	5	4	8	7	6	10
2008	66	14	7	5	11	10	8	13
2009	84	17	9	6	13	12	10	16
2010	105	22	11	7	17	15	13	20
2011	137	29	14	9	21	20	17	26
2012	173	37	18	11	27	25	21	33
2013	213	46	23	14	32	31	26	41
2014	258	56	27	16	39	38	32	50
2015	307	68	33	19	46	45	38	59

Note: Coverage is assumed to rise between 2000 and 2015 from 15 to 80 per cent for non-marital sex and 5 to 30 per cent for marital sex. Female condoms go from 0 per cent of the total in 2000 to 0.2 per cent in 2003 to 1 per cent in 2010 to 2 per cent in 2015.

Table B4. Cost of condoms required for rising coverage, by region, 2000-2015 (million U.S. dollars)

Year	Developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
2000	76.1	14.7	7.4	6.2	13.0	10.9	9.1	14.8
2001	102.2	19.8	10.1	8.3	17.3	14.6	12.2	19.9
2002	129.7	25.3	12.9	10.4	21.8	18.5	15.5	25.2
2003	158.6	31.2	15.9	12.5	26.5	22.7	19.0	30.8
2004	190.1	37.6	19.2	14.8	31.6	27.2	22.8	36.9
2005	223.2	44.4	22.8	17.1	36.9	31.9	26.8	43.3
2006	256.9	51.6	26.4	19.3	42.1	36.8	30.9	49.8
2007	291.7	59.1	30.1	21.5	47.4	41.9	35.2	56.5
2008	327.7	67.1	34.0	23.6	52.7	47.2	39.7	63.3
2009	364.6	75.3	38.1	25.7	58.1	52.6	44.3	70.4
2010	402.3	83.9	42.3	27.8	63.5	58.2	49.0	77.6
2011	442.3	93.3	46.6	29.8	69.0	64.2	54.0	85.3
2012	482.6	103.1	51.1	31.8	74.4	70.2	59.1	93.1
2013	523.0	113.0	55.5	33.6	79.7	76.2	64.1	100.8
2014	563.1	123.2	60.0	35.3	84.7	82.3	69.1	108.5
2015	602.7	133.4	64.4	36.9	89.6	88.2	74.1	116.0

Note: Male condoms are priced at $0.035 each, female condoms at $0.65 in 2000, falling to $0.25 in 2015.

Table B5. Cost of condoms required for rising coverage, by UNFPA region, 2000-2015 (millions U.S. dollars)

Year	All UNFPA regions	Arab States/ Europe	Africa	Asia Pacific	Latin America
2000	75.8	12.7	14.3	34.1	14.7
2001	101.9	17.0	19.4	45.7	19.7
2002	129.3	21.5	24.7	58.0	25.0
2003	158.1	26.2	30.4	70.8	30.6
2004	189.5	31.4	36.7	84.8	36.6
2005	222.5	36.7	43.4	99.5	43.0
2006	256.1	42.0	50.4	114.3	49.4
2007	290.8	47.4	57.8	129.6	56.1
2008	326.6	52.8	65.5	145.4	62.9
2009	363.4	58.4	73.5	161.6	69.9
2010	401.1	64.1	81.9	178.0	77.1
2011	441.0	69.9	91.2	195.2	84.7
2012	481.2	75.7	100.7	212.4	92.4
2013	521.4	81.4	110.4	229.5	100.1
2014	561.4	87.0	120.3	246.3	107.8
2015	600.9	92.4	130.3	262.9	115.3

Table B6. Condoms required for low or high coverage of risky sex, by region, 2000-2015 (millions)

Year	Developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
Low coverage								
2000	1,959	748	73	64	234	129	472	238
2001	2,076	809	76	64	243	144	490	250
2002	2,231	899	79	66	253	159	512	264
2003	2,440	1,033	82	67	262	175	537	283
2004	2,808	1,197	89	83	289	233	570	348
2005	3,416	1,373	124	141	353	331	616	479
2006	3,970	1,526	178	207	411	429	612	606
2007	4,586	1,692	246	274	479	536	613	746
2008	5,282	1,893	311	340	543	645	661	889
2009	5,999	2,105	379	404	608	757	710	1,036
2010	6,740	2,327	449	468	675	873	761	1,187
2011	7,481	2,558	519	527	737	990	810	1,340
2012	8,240	2,800	591	585	799	1,111	859	1,495
2013	9,020	3,053	665	641	862	1,234	910	1,655
2014	9,818	3,317	738	696	924	1,362	962	1,819
2015	10,634	3,593	812	749	987	1,493	1,015	1,984
High coverage								
2000	11,790	2,274	1,217	1,012	1,915	1,608	1,395	2,369
2001	12,501	2,426	1,300	1,058	2,020	1,707	1,482	2,508
2002	13,236	2,585	1,387	1,104	2,127	1,810	1,571	2,652
2003	13,996	2,750	1,478	1,151	2,237	1,916	1,664	2,800
2004	14,782	2,923	1,573	1,199	2,349	2,025	1,760	2,953
2005	15,595	3,102	1,673	1,247	2,464	2,139	1,860	3,110
2006	16,372	3,287	1,766	1,282	2,564	2,251	1,959	3,262
2007	17,173	3,480	1,864	1,316	2,666	2,367	2,062	3,418
2008	17,996	3,681	1,964	1,351	2,768	2,486	2,168	3,578
2009	18,843	3,890	2,068	1,385	2,872	2,609	2,277	3,742
2010	19,715	4,108	2,176	1,418	2,977	2,736	2,390	3,910
2011	20,536	4,332	2,275	1,442	3,064	2,857	2,495	4,072
2012	21,378	4,564	2,376	1,465	3,152	2,981	2,602	4,237
2013	22,240	4,806	2,481	1,488	3,239	3,109	2,712	4,405
2014	23,124	5,057	2,588	1,509	3,327	3,239	2,825	4,578
2015	24,030	5,319	2,698	1,531	3,414	3,373	2,941	4,754

Note: Low coverage is based on country-specific rates derived from Stover (2005). Population-weighted averages of the rates, for non-marital sex, go from 8 per cent in 2000 to 59 per cent in 2015, and, for marital sex, from 11 to 24 per cent. High coverage is 50 per cent in 2000 for each country, rising to 80 per cent in 2015.

Table B7. Cost of condoms required for low or high coverage of risky sex, by region, 2000-2015 (millions of U.S. dollars)

Year	Developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
Low coverage								
2000	68.6	26.2	2.6	2.2	8.2	4.5	16.5	8.3
2001	73.5	28.6	2.7	2.3	8.6	5.1	17.3	8.8
2002	79.8	32.1	2.8	2.4	9.0	5.7	18.3	9.4
2003	88.0	37.3	3.0	2.4	9.5	6.3	19.4	10.2
2004	102.8	43.8	3.3	3.0	10.6	8.5	20.8	12.7
2005	126.6	50.9	4.6	5.2	13.1	12.3	22.8	17.7
2006	148.7	57.2	6.7	7.8	15.4	16.1	22.9	22.7
2007	173.4	64.0	9.3	10.4	18.1	20.3	23.2	28.2
2008	201.2	72.1	11.9	12.9	20.7	24.6	25.2	33.9
2009	229.9	80.7	14.5	15.5	23.3	29.0	27.2	39.7
2010	259.4	89.6	17.3	18.0	26.0	33.6	29.3	45.7
2011	290.7	99.4	20.2	20.5	28.6	38.5	31.5	52.1
2012	322.4	109.6	23.1	22.9	31.3	43.5	33.6	58.5
2013	354.4	120.0	26.1	25.2	33.9	48.5	35.8	65.0
2014	386.3	130.5	29.0	27.4	36.4	53.6	37.9	71.6
2015	417.9	141.2	31.9	29.4	38.8	58.7	39.9	78.0
High coverage								
2000	412.7	79.6	42.6	35.4	67.0	56.3	48.8	82.9
2001	442.4	85.9	46.0	37.4	71.5	60.4	52.4	88.8
2002	473.2	92.4	49.6	39.5	76.0	64.7	56.2	94.8
2003	504.8	99.2	53.3	41.5	80.7	69.1	60.0	101.0
2004	541.0	107.0	57.6	43.9	86.0	74.1	64.4	108.1
2005	578.0	115.0	62.0	46.2	91.3	79.3	68.9	115.3
2006	613.5	123.2	66.2	48.0	96.1	84.4	73.4	122.2
2007	649.4	131.6	70.5	49.8	100.8	89.5	78.0	129.3
2008	685.6	140.2	74.8	51.5	105.5	94.7	82.6	136.3
2009	722.1	149.1	79.3	53.1	110.1	100.0	87.3	143.4
2010	758.7	158.1	83.8	54.6	114.6	105.3	92.0	150.5
2011	798.0	168.3	88.4	56.0	119.1	111.0	96.9	158.2
2012	836.5	178.6	93.0	57.3	123.3	116.7	101.8	165.8
2013	873.9	188.8	97.5	58.5	127.3	122.2	106.6	173.1
2014	909.9	199.0	101.8	59.4	130.9	127.5	111.2	180.1
2015	944.4	209.0	106.0	60.2	134.2	132.6	115.6	186.8

ANNEX C. PROJECTING DRUGS AND MEDICAL SUPPLIES FOR REPRODUCTIVE HEALTH

In discussing the calculation of reproductive health commodity costs, this annex considers first how numbers of episodes of reproductive health conditions are estimated and then how commodities to deal with them are identified and costs assigned. The procedures are implemented by country, though many of the parameters are regional or even global.

Tabular results are provided only by region, complementing the information in the main report, but without further textual discussion. We do however discuss and provide tables on alternative estimates made under different assumptions about some incidence rates, trends in some rates, and targeted coverage.

Conditions and cases

The reproductive health conditions considered cover antenatal care and delivery, pregnancy complications, sexually transmitted infections, and related newborn infections (Table C1). We leave out some areas on the ambitious list of the International Conference on Population and Development (ICPD 1995: Art. 7.6), such as treatment of infertility and reproductive tract cancers.

The base for calculation of cases is demographic data on births and women, particularly women aged 15-49 years (United Nations 2005). For instance, number of deliveries in each year is set equal to number of births, so that projections of births from 2000 to 2015 provide projections of the deliveries that need to be attended.

Antenatal care and normal delivery. Antenatal care is assumed to involve all women giving birth plus a few more, given that 15 per cent of pregnancies end in miscarriage or spontaneous abortion and 15 per cent of these occur after 12 weeks. (Simpson [1990] reports, for instance, that 3 per cent of viable pregnancies are lost after eight weeks.) We increase the number of births by 5 per cent to allow, in addition, for some late induced abortions.

All antenatal care services (listed in Table C1) are assumed to be provided in each case, with the exception of services related to malaria. Malaria prevention services are assumed to be provided only in countries where malaria is endemic: to all women receiving antenatal care, where malaria prevalence is at least 0.5 per cent (according to WHO); to none, where prevalence is below 0.1 per cent; and to a proportional number, where prevalence is in between. (Proportional provision, say of 50 per cent, does not of course mean that every other woman receives it in a particular area, but that malaria prevention services are provided in some areas with higher prevalence but not in others in the same country where the risk is nominal.) Treatment is

provided in fewer cases, estimated by multiplying the number receiving antenatal care by malaria prevalence.

For deliveries, the total number is not the only issue. One also has to classify births by medical procedure, distinguishing normal deliveries from assisted vaginal deliveries and Caesarian sections. Normal deliveries are calculated as a residual; how the other two categories are determined is discussed after considering the pregnancy complications that might require these procedures.

Major pregnancy complications and other deliveries. For four of the five major complications responsible for most maternal deaths, we rely initially on incidence rates calculated in the Global Burden of Disease (GBD) exercise (Mathers et al. 2002). Rates reported for WHO regions and subregions per 100,000 women are converted to ratios to births using demographic estimates for 2000 (Table C2). This ensures that numbers of cases will decline as fertility falls, rather than rising with numbers of women.

The estimates for maternal haemorrhage require a caution. The GBD figures give estimates that average 4.4 per cent of births in high-mortality regions (in WHO parlance, regions labeled B to E), with the highest incidence in Eastern Mediterranean B: 5.6 per cent. An article by AbouZahr (2003) gives a worldwide estimate for "severe post-partum haemorrhage" of 10.5 per cent, and an earlier estimate (AbouZahr 1998) is slightly higher, though for developing regions only, at 11.0 (for mothers aged 15-44). If ante-partum haemorrhage were added to these high estimates, the gap would grow even larger between them and the GBD estimates of "maternal" haemorrhage. We have no way to reconcile these differences, and for now stay with the GBD estimates, which put the number of cases of maternal haemorrhage roughly in the range of cases of the other major complications rather than several times as many.

For the fifth of the major complications, post-abortion complications, we rely not on the GBD but on a recent attempt to estimate incidence of unsafe abortion (Åhman and Shah 2004). This gives regional estimates, with an overall ratio of 16 unsafe abortions per 1,000 women aged 15-44 in developing regions. Hospitalizations for abortion complications are close to 20 per cent of the estimated number of abortions for eight out of ten developing countries with some data (Henshaw, Singh, and Haas 1999: Table 3). The reliability of these hospitalization data is uncertain, but the result is in line with estimates that medical care will be needed in 10-50 per cent of cases (Morris et al. 1979; WHO 1997). We therefore multiply unsafe abortion rates by number of women and then by 20 per cent to obtain an estimate of the need for post-abortion care.

Unlike the other complications, we project post-abortion complications based on number of women rather than number of births.

Taken together, these rates for major complications may have one problem. They indicate that almost 25 per cent of births in developing regions involve a major complication—substantially higher than the often cited WHO (1994) estimate of 15 per cent. There is no specific empirical basis for the WHO estimate. However, Bang et al. (2004) appear to validate it in a prospective rural community study in India, and Prual et al. (2000) report even lower rates of 3-9 per cent for "severe maternal morbidity" across community studies in West Africa. The precise criteria used differ, so exact comparisons are not possible. The suggestion remains, however, that the GBD estimates may be somewhat high.

We therefore adjust downward the regional rates for three of the major complications. We use the ratio of AbouZahr's (2003) worldwide estimates for each of these conditions (also in Table C2) to equivalent worldwide estimates calculated from the GBD data. This reduces rates for maternal sepsis and obstructed labour by about 20 per cent and rates for hypertensive disorders by 40 per cent. All five major complications would then total about 20 per cent of births. (Some results are considered below, for comparison, without this adjustment.)

The estimates for obstructed labour do not cover prolonged labour, which is important to estimate because it indicates a need for intervention. We use "prolonged labour" to indicate labour exceeding 16 hours, but excluding cases of obstructed labour, to avoid double counting. The approach used in estimating incidence, as well as the need for something other than spontaneous vaginal delivery, is complicated because of the inferences that must be drawn from limited data, and also because we prefer to make the need for these deliveries dependent on the incidence of obstructed and prolonged labour.

One way to estimate a rate for prolonged labour is indirect, relying on studies in the literature for industrial countries. The causes of prolonged and obstructed labour are reported to be inefficient uterine action (65 per cent), persistent occipitoposterior position (24 per cent), and cephalopelvic disproportion (11 per cent) (Malone et al. 1996). Persistent occipitoposterior position leads to obstructed labour possibly about half the time (Sizer and Nirmal 2000). If we assume that inefficient uterine action never leads to obstructed labour and cephalopelvic disproportion always does, then the ratio of prolonged to obstructed labour would be about 3:1.

Another approach to estimating prolonged labour is to take rates directly from surveys. Bang et al. (2004) report prolonged labour as involving 10.1 per cent of births in a prospective community study in India, and Prual et al. (2000) report dystocia as involved in 2.05 per cent of births in West Africa. Neither study reports a separate rate for obstructed labour, which is presumably included in these estimates. However, the GBD rate for obstructed labour is by itself more than double the Prual et al. rate for dystocia (even after we have adjusted the GBD rate downward). There is no obvious way to reconcile all these figures, and we settle for attempting to match the intermediate estimate from Bang et al. (2004). A ratio of prolonged to obstructed labour of 1.1:1 would produce a rate of prolonged and obstructed labour combined of 10.0-12.9 per cent, depending on whether the higher or lower rates for obstructed labour (directly from Mathers or adjusted to match AbouZahr) are adopted.

The need for operative vaginal delivery and Caesarian section is estimated indirectly. The outcomes, for prolonged and obstructed labour combined, are reported as follows: 35 per cent normal delivery, 41 per cent assisted vaginal delivery, and 24 per cent Caesarian section (Malone et al. 1996). For a control group in the same study that did not experience such labour, the outcomes were 82 per cent normal delivery, 13 per cent assisted vaginal delivery, and 4 per cent Caesarian section. With the added assumption that 90 per cent of cases of obstructed labour require Caesarian section and the rest require assisted vaginal delivery (AbouZahr 2003:9), it is possible to calculate the need for each type of delivery. The results (with some rounding upward for normal delivery) appear in Table C1 under assisted vaginal delivery and Caesarian section.

If obstructed labour is involved in 4.6 per cent of all births, as AbouZahr (2003:9) estimates for the world as a whole, the overall distribution of outcomes would be 78 per cent normal delivery, 13 per cent assisted vaginal delivery, and 9 per cent Caesarian section. If it is involved in 6.1 per cent of births, which is the somewhat higher estimate from Mathers et al. (2002), the corresponding distribution would be 75, 14, and 11 per cent respectively. A hospital study (Bohra et al. 2003) reports an overall distribution of 72 per cent normal delivery, 24 per cent assisted vaginal delivery, and 4 per cent Caesarian section—slightly below our estimate for normal delivery and somewhat lower for Caesarian section. Except for Caesarian section, the rates are at least roughly similar. Since guidelines suggest that an appropriate rate for Caesarian section is between 5 and 15 per cent (United Nations Children's Fund, World Health Organization, and United Nations Population Fund 1997), we do not make further adjustments.

Other complications. Three additional complications are considered, for which crude estimates

must be made because of the lack of data even of the quality of the Global Burden of Disease.

Epidemiological data seem particularly lacking for the first complication, urinary tract infections. This is a very common problem. A Kenya study suggests 50 per cent prevalence (Fujisaki et al. 1998), and a commonly accepted U.S. estimate is that half of all women have an infection in their lifetimes. With different fertility assumptions, the lifetime estimate could give a ratio of 17-32 per hundred births (Bulatao 2004); we adopt an incidence ratio of 25 per cent of births.

The second complication is mastitis, a staphylococcal breast infection that affects women who are breastfeeding. We adopt an estimate of 15 per cent of births, in the range of some studies from industrial and developing countries that provide estimates (Bulatao 2004, Bang et al. 2004).

The third complication, obstetric fistula or a hole in the vaginal wall due to injury in childbirth, is believed to affect 2 million women, with 50,000 to 100,000 new cases annually, though some consider these underestimates (Cook, Dickens, and Syed 2004). Most obstetric fistulas result from inadequately managed cases of obstructed labour (e.g., Tahzib 1983, Ampofo et al. 1990, Danso et al. 1996, Hilton and Ward 1998, Charua Guindic et al. 2004). We assume that 1 per cent of cases of obstructed labour lead to fistula, which, given our estimates of obstructed labour, would lead to roughly 70,000 cases a year. This is about the same number given by AbouZahr (2003:9), who estimates 73,000. Two hospital studies in Nigeria give much higher rates: 0.11-0.35 per cent of deliveries (Harrison 1985, Ijaiya and Aboyeji 2004), which, by our calculations, would imply that 2-7 per cent of cases of obstructed labour lead to fistulas. It is arguable, however, that cases of obstructed labour are more likely to end up in hospitals than normal deliveries, explaining the higher Nigerian estimates. Note that we cover only current cases, not previous untreated fistulas, which also require attention.

Sexually transmitted infections. Among sexually transmitted infections, we focus on four major ones, which are (alphabetically) chlamydia, gonorrhea, syphilis, and trichomoniasis. The Global Burden of Disease exercise provides estimates, but these appear to be confined to cases that develop overt, severe symptoms. We therefore rely on a separate WHO report (2001) that estimates cases by region for 1999. (We take the estimates as applying to 2000.) Numbers of female cases are converted to ratios to numbers of women aged 15-49 years. Some cases may fall outside this age range, but they are included in the numerator, so there is no underestimation (Table C3).

Male infections, also reported in WHO (2001), are included in the calculations following the same procedure. It is important to note that reaching men would require an intensive program separate from the maternal and child health programs that typically reach women, implying substantial additional organizational, infrastructural, and financial resources.

We also cover an important sequel of sexually transmitted infections, pelvic inflammatory disease. Given the lack of data on this, we estimate it under the assumption that it results from untreated gonorrhea or chlamydia or from maternal sepsis, for each of which a mode of estimation was earlier provided. How often gonorrhea and chlamydia are untreated depends on whether they stay asymptomatic and should vary by region. We follow assumptions about these and about the likelihood of maternal sepsis leading to pelvic inflammatory disease derived in Bulatao (2004) mainly using parameters in Rowley and Berkley (1998). The resulting rates vary from 0.25 per cent of women 15-49 in East Asia and the Pacific to 2.5 per cent in sub-Saharan Africa.

Newborn infections. For neonatal sepsis, a bacterial blood infection, four studies in developing countries and one in Spain give rates of 0.35 to 1.1 per cent (see Bulatao 2004). One Indian rural study does suggest a rate of 17 per cent (Bang et al. 2001), but we adopt an estimate of 0.5 per cent of births.

Sexually transmitted infections also threaten the newborn. Gonorrhea and chlamydia in the mother can lead to a form of conjunctivitis called ophthalmia neonatorum, which is acquired during labour or delivery. We cost a relatively inexpensive preventive intervention recommended for all newborns, so the estimated number of cases is simply the number of births.

Syphilis can be acquired by the fetus in the womb. One early estimate of the risk of transmission is 70 per cent (Ingraham 1950), but it is also believed that, for term deliveries, the likelihood of transmission is about 40 per cent (Isaacs and Moxon 1991). We use the latter figure and multiply it by the prevalence of syphilis among adult women. Prevalence is not reported in WHO (2001), except for some individual countries. We estimate it from reported incidence, using estimates of duration of infection drawn from Rowley and Berkley (1998). Regional groupings are not identical between these reports, however, so we use the closest approximations. Multiplying the product by births gives an estimate of congenital syphilis.

We cover, finally, prevention of mother-to-child HIV transmission. Rates for this are straightforward to estimate: number of births times the prevalence of HIV among women aged 15-49 (UNAIDS 2004).

Commodities, costs, and coverage

Standard treatment guidelines in WHO (2003) provide information about the commodities needed for each condition. Annex D lists the drugs and other medical supplies recommended. The cost of these drugs and medical supplies was determined from UNICEF (2004) price lists and the Management Sciences for Health International Price Indicator Guide (2003).

Determining the cost per case is complex. Different treatments may be available for a particular condition, and we require an estimate of the proportion of cases in which each treatment is appropriate, Then we need to specify the quantity of each commodity consumed in each of these cases, which may depend on a complex dosing schedule. We also need the unit cost of the commodity, which is often expressed in different units from the units of consumption. These calculations are all shown in Annex D. Multiplying the mean cost per episode (summarized in Table C4) by the number of episodes derived under the rules in Table C1 would give estimates and projections of total commodity costs.

We do not, however, estimate such costs but only the costs of cases that are covered or targeted for coverage. Coverage, in the year 2000, is based on survey reports of the proportion of women who receive maternal health services. For antenatal services, we use the percentage of women aged 15-49 years attended at least once during pregnancy by trained health personnel (UNICEF 2001a). For normal delivery, we use the percentage of births attended by trained health personnel (UNICEF 2001b). For complicated deliveries, pregnancy complications, and sexually transmitted infections, we use—in the absence of specific data—75 per cent of the proportion for attended deliveries. In each case, where country reports are not available, we apply regional averages. In effect, services for complications are assumed to be more limited initially than services for normal delivery.

The per cent of cases covered is assumed to rise linearly, reaching 95 per cent by 2015 for each condition. Weaker services, therefore, must expand faster. We consider below alternative ways to set coverage targets that allow more flexibility.

Main results

Main results are shown, generally broken down by year and in some instances by region, in tables that follow, the number of cases per condition in Tables C5-C6, cases covered by services in Table C7, and the commodity costs of providing the indicated coverage, broken down in various ways, in Tables C7-C11. Table C12 summarizes costs by UNFPA region.

Alternative estimates

Although we attempt to use the best available data, some of our calculations are based on limited information or estimates by others for which the evidence is not entirely clear. Existing data provide no way to validate all our assumptions. We can, nevertheless, look at the effect on the estimates of changing a few assumptions.

Major obstetric complications. We have used parameters that imply that major obstetric complications occur in 20-21 per cent of births in developing regions. This is somewhat higher than a consensus WHO (1994) estimate that urgent care is required in 15 per cent of births, but largely in line with recent global estimates for several of the conditions (AbouZahr 2003).

Could the number of major complications be still higher? The possibility is suggested by other WHO figures provided as part of the exercise to assess the Global Burden of Disease (GBD; Mathers et al. 2002) that suggest that 25-26 per cent of births involve major complications. If the GBD figures are correct, then estimates for three of the five major complications would be higher. Maternal sepsis would be a factor in 7.0 per cent rather than 5.6 per cent of births in developing regions in 2000, hypertensive disorders in 6.6 rather than 4.1 per cent, and obstructed labour in 7.4 rather than 5.8 per cent. Cases involving any of the major obstetric complications would be 30.2 million rather than 24.7 million in 2000 and 32.5 million rather than 26.7 million in 2015. Normal deliveries would be fewer at 75.5 per cent of the total rather than 77.6 per cent, and assisted vaginal deliveries and Caesarian sections would be more numerous at 13.5 per cent 10.9 per cent respectively.

Commodity costs at targeted levels would be higher, for major obstetric complications, by 15 per cent. This implies 8-9 per cent higher commodity costs for all delivery care (including treating complications) and 3-5 per cent higher commodity costs for all conditions combined. (Table C13).

Effects of services: specifications. The calculations incorporate trends in births and population growth, therefore taking into account the impact of spreading contraceptive use. Other possible effects of the services covered in this report on the incidence of particular conditions have not been incorporated into the cost projections. Instead we generally assume that incidence rates for different conditions are unchanged over time.

There are several reasons for this assumption. A number of the interventions to which we assign commodity costs are curative rather than preventive and should not therefore affect the incidence of the related

conditions. For instance, treating post-abortion complications has no direct effect on the frequency of unsafe abortion. Some preventive interventions affect other conditions: preventive interventions that are part of antenatal care do not reduce the need for antenatal care itself. Other preventive interventions are costed only for a subset of the population at risk. Measures to protect against malaria have been costed only for pregnant women. Whether and how much this should affect the prevalence of malaria among others who will become pregnant in subsequent years is beyond the scope of this report to determine. For a number of conditions, also, no clear trends appear from incidence rates a decade or so apart, and contrasts between developing and industrial regions, though they exist, are relatively modest. Even where services could reduce incidence rates, one may be uncertain how effectively the commodities we cost will be deployed, and whether relatively short-term reductions in incidence can be expected.

Several of these qualifications apply to pregnancy complications and sexually transmitted infections. Neither aggregate data about a decade apart nor cross-regional comparisons suggest any strong trends. For the major pregnancy complications, we can compare estimates derived from Murray and Lopez (1998), which are meant to be for 1990, with the estimates we use from Mathers et al. (2002), which are meant to be for 2000. The latter rates are on average lower, but some, such as those for obstructed labour and maternal hypertension, appear slightly higher (Bulatao 2004: Table 2). Across countries, industrial regions have an advantage over developing regions, but it is generally moderate—except for unsafe abortion, which may be less a matter of service improvement than broad public policy and is difficult to predict. Similarly, for sexually transmitted infections, comparisons of estimates assigned to 1990 and to 1999, as well as comparison of estimates from the same source (WHO 2001) for 1995 and 1999 suggest some possible overall decline, but trends are different for different infections and go in different directions across regions. Industrial countries may have somewhat lower rates of infection, but short-run trends are not convincingly demonstrated.

Though in general we assume no decline in incidence rates for complications, for a few conditions a decline in incidence rates does seem possible when services expand.

• Maternal sepsis incidence rates appear to have fallen from 9.5 per cent of births in 1990 in developing regions to 5.8 per cent of births in 2000 in high-mortality WHO regions (Murray and Lopez 1998 and Mathers et al. 2002, compared in Bulatao 2004). These groups of countries do not exactly match, but compare also the African regions: 11.4 per cent in 1990 for sub-Saharan Africa, 6.5 per cent in 2000 for Africa E and 6.2 per cent for Africa D. In addition, the rate is just over 3

per cent in 2000 in lower-mortality Europe A, Western Pacific A, and Americas A. These infections might be minimized with better care, though even proper training of health service providers may not be enough to eliminate the condition (e.g., Goodburn et al. 2000). We could assume that incidence should decline over time as commodities become more available (and presumably other inputs also increase), not falling to zero but to 3 per cent of births when coverage of all deliveries reaches 100 per cent. Since the proportion of deliveries competently covered by services only rises to 95 per cent in these projections, rates of maternal sepsis would not fall quite as low as 3 per cent.

• Neonatal sepsis, we assume, should decline to 0.3 per cent incidence with 100 per cent coverage of deliveries.

• Obstetric fistula is avoidable with proper management of obstructed labour. (A few cases do result from Caesarian sections, but we do not cover this pathway.) We assume that new cases of fistula should decline to zero at 100 per cent coverage of obstructed labour.

• For sexually transmitted infections, the effect of treatment at limiting spread is uncertain (Sangani, Rutherford, and Wilkinson 2004). The use of condoms, however, goes with a decline in incidence in high-risk populations (van Ameijden et al. 1994, Laga et al. 1994, Nelson et al. 1996, Tanaka et al. 1996, Ford et al. 2002), possibly dependent on other elements of control programs that also reduce the frequency of risky sex (Jackson et al. 1997). For instance, the use of condoms in commercial sex in Thailand rose from 14 to 94 per cent in 1989-1993, while cases of five major infections in men declined by 79 per cent (Hanenberg 1994).

We assume that condom use in risky sex rises from current low levels: from 9.2 to 51.1 per cent of incidents (on average across developing regions and across marital and non-marital incidents, as determined from Tables B2 and B3). The reduction in incidence of unprotected risky sex is therefore 3 percentage points annually, which could imply a similar decline in the incidence of sexually transmitted infections. Note, however, that, relative to incidence rates in industrial regions, rates are already substantially lower for all four major infections in Other Asia and Pacific and somewhat lower for three out of four infections in the Mideast and North Africa (see Table C3). We assume no decline in these instances. For other instances, we set an approximate average of rates in industrial regions as a minimum to be reached should unprotected risky sex ever fall to zero. The minima, which apply to both sexes: 3 per cent for chlamydia, 1 per cent for gonorrhea, 0.1 per cent for syphilis, and 5 per cent for trichomoniasis.

Figure C1. Cases of two conditions, without and with incidence rate reductions as services expand, 2000-2015 (millions)

Syphilis

11.9 12.1 12.4 12.7 12.9 13.2 13.4 13.7 14.0 14.2 14.5 14.7 15.0 15.2 15.5 15.7
      11.7 11.6 11.4 11.2 11.0 10.8 10.5 10.3 10.0 9.7 9.4 9.0 8.7 8.3 7.9

Maternal sepsis

5.6 5.6 5.6 5.6 5.7 5.7 5.7 5.7 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.9
     5.5 5.4 5.3 5.2 5.1 5.1 5.0 4.9 4.8 4.7 4.6 4.5 4.4 4.3 4.2

2000   2005   2010   2015
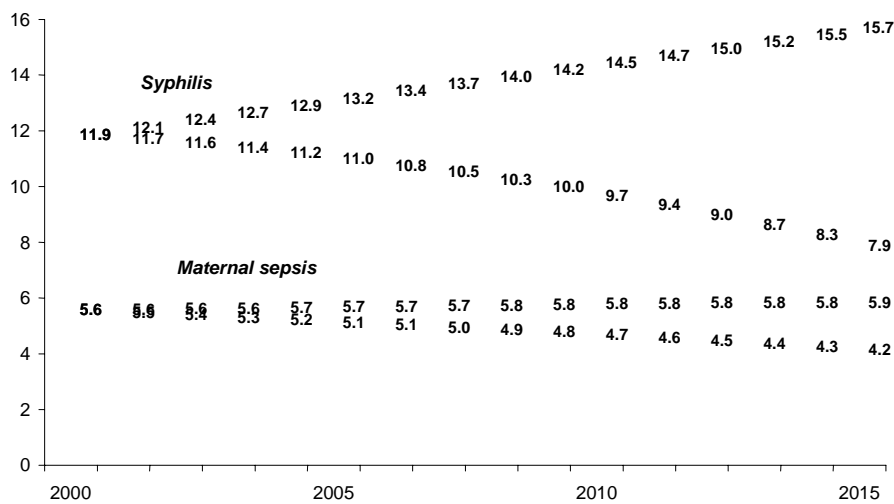
This is obviously a crude approach. We could assume lower minima, down to levels in Other Asia and Pacific or even to zero, but we are only covering risky sex and not all sex. Reductions in infection incidence, in reality, will probably not be linear, but will depend on reaching some critical level of protection. Levels of protection that work for one infection may not work for another, depending especially on transmission rates. And the relevant core group for one infection may not be as relevant for another infection (Stigum et al. 1995). Given the difficulties of weighing all such factors, we choose the approach indicated because it does produce some decline and is relatively simple.

With declines in sexually transmitted infections, pelvic inflammatory disease (PID) could also be expected to decline. The baseline estimates for PID are indirect, with the same approach and some of the same parameters used for earlier and later estimates, so comparisons over time show little trend. However, incidence for industrial countries is half that in developing countries, and declines in maternal sepsis, as well as better coverage for gonorrhea and chlamydia, should produce reductions in PID. We assume the incidence rate for PID declines, reaching 1 per cent (unless it is already lower) when the average coverage for gonorrhea (with condoms), chlamydia (with condoms), and deliveries reaches 100 per cent.

In order to estimate trends in congenital syphilis and in the need to protect against vertical transmission of HIV, we need trends in prevalence rather than in incidence. We estimate these trends in the same way as for incidence, setting minima, based on levels in industrial regions, of 0.03 per cent for female adult syphilis prevalence and 0.12 for female adult HIV prevalence. Rising condom use, when it reaches 100 per cent of risky sex, is assumed to move prevalence rates to these minima.

Effects of services: results. The results of making these assumptions for two particular conditions are shown in Figure C1. Maternal sepsis in 2015 would occur in 3.3 per cent of deliveries, not 4.6 per cent as estimated when no effect of services is assumed. In other words, the incidence rate by 2015 would be 29 per cent lower than previously estimated. This reduction of 29 per cent is intermediate among the conditions considered, for which reductions by 2015 range from 17 to 91 per cent (for obstetric fistula). The amount of reduction largely depends on the gap between initial levels and the minimum we set, so that for syphilis, for which the initial gap is larger, the reduction appears larger.

Commodity costs are reduced by the same percentages. Though the percentage reduction is not the highest for maternal sepsis, this condition accounts for 80 per cent of the commodity costs in this group of conditions and therefore has by far the largest effect on total costs. Nevertheless, total costs decline only marginally—not at all, of course, for 2000, and by 2.5 per cent by 2015 (Table C14).

What is not covered in this consideration of health trends is important to note. Only effects on the particular reproductive health services are modeled. Other health services, such as care for victims of HIV, could be affected. We do not model effects of long-term secular trends (with the exception of fertility trends), which may have little relation to health service effectiveness. For instance, changes in women's tendency to choose and ability to obtain Caesarian sections are not modeled and could raise rather than lower commodity costs.

Figure C2. Percent change in 2015 commodity cost with alternative coverage targets, by region

Sub-Saharan Africa | Middle East Crescent | Eastern Europe | China | India | Other Asia & Pacific | Latin America & Caribbean

3%
2%
1%
0%
-1%
-2%
-3%
-4%
-5%
-6%
-7%

Sub-Saharan Africa: -5.1%, -5.5%, -0.1%
Middle East Crescent: -4.9%, -2.6%, 1.3%
Eastern Europe: -1.9%, 0.6%, 1.6%
China: -5.3%, -2.1%, 1.6%
India: -5.3%, -6.6%, -0.7%
Other Asia & Pacific: -5.2%, -6.3%, -0.5%
Latin America & Caribbean: -4.7%, -0.1%, 2.5%

Alternative targets
□ *Fixed 90% coverage*
■ *80% reduction in unserved*
■ *90% reduction in unserved*

Alternative targets. The target we have set of 95 per cent coverage of cases of each condition in each country is arbitrary. Some countries are unlikely to reach such a target. To expect Niger, with 16 per cent of births professionally attended, or Pakistan, with 20 per cent, to reach 95 per cent coverage by 2015 would require extraordinary efforts that would probably, in the end, not be sustainable.

More realistic targets might be set by exempting certain countries—which is the effective result when only certain countries are studied—or by setting lower targets for them. Or a lower overall target might be set, recognizing that, whereas many countries should aim at 95 per cent, some should set targets that are more practicable. We consider both a lower fixed target of 90 per cent overall and variable targets for different countries, to see how commodity costs would be affected.

Figure C2 shows how total commodity costs for 2015 would change with targets that differ from standard 95 per cent coverage. With a fixed 90 per cent target, total costs would be 5.0 per cent lower by 2015. The cost reductions would vary. For Eastern Europe, for instance, the reduction would be only 1.9 per cent, mainly because levels of coverage, already over 90 per cent for particular countries and conditions, are not assumed to decline.

An alternative, variable target can be defined as, say, an 80 per cent reduction in the number of those not covered by services for each condition. This target is variable because the effective level of coverage to be reached depends on how high initial coverage is, which can vary by country and condition. Lower initial coverage implies a less demanding target. For instance,

if initial coverage is 20 per cent, the target is effectively 84 per cent coverage by 2015; if initial coverage is 80 per cent, the target becomes 96 per cent coverage. Note that, unlike with fixed targets, countries or specific conditions with high coverage that is still short of 100 per cent are still expected to make some progress.

A variable target of 80 per cent reduction of the unserved would lead to almost the same aggregate commodity costs as a fixed 90 per cent target. Aggregate commodity costs would be marginally higher, by 0.6 per cent by 2015. However, the distribution of costs would be different. For Eastern Europe, seeking an 80 per cent reduction is marginally more demanding than the preceding targets, requiring a small expansion of services. But for regions with weaker infrastructure, particularly India, Other Asia and Pacific, and sub-Saharan Africa, an 80 per cent reduction is less demanding and more commensurate with capabilities.

Figure C2 also shows another alternative target: a 90 per cent reduction in the unserved. This alternative has the same aggregate costs as a fixed 95 per cent target, but again the distribution of costs across regions, and to some extent across specific conditions, is slightly different (Table C15).

Implications. Alternative parameters produce some changes in projected commodity costs. If major obstetric complications occur in one out of four rather than one out of five births in developing regions, commodity costs for 2011-2015 would be $9.05 billion rather than $8.64 billion. If instead of constant incidence rates, we allow them to fall because of the services to be provided, costs would fall, for this five-year period to $8.45 billion. If alternative targets were defined, particularly a target of reducing the number not served

Figure C3. Change in commodity cost with alternative assumptions, 2000 and succeeding five-year periods to 2015 (million U.S. dollars)
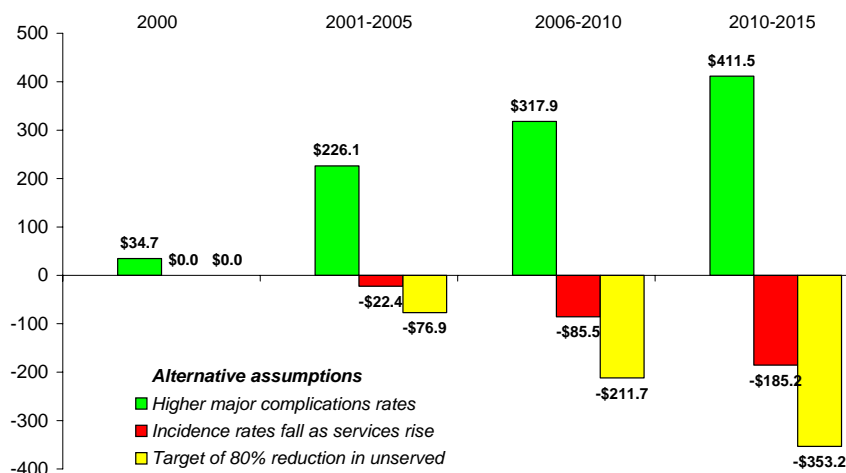
by 80 per cent, costs would also fall, to $8.28 billion in 2011-2015 (Figure C3).

Changes would be smaller for earlier periods, and in any case would be less than 5 per cent in either direction. Allowing incidence rates to decline because of service provision, for instance, reduces costs, over the entire period from 2000 to 2015, by 1 per cent. The changes are therefore modest, though more extreme assumptions could of course produce greater changes.

One significant aspect of the changes is that they vary by region (Figure C4). Allowing incidence rates to decline because of service provision has almost no effect on commodity costs in Eastern Europe and China (where maternal sepsis is already low) but a small effect in other regions. Setting variable and more realistic targets

mainly has implications for sub-Saharan Africa and Asia (aside from China), where more measured expansion of services may imply more durable gains. For global estimates in the main report, nevertheless, we have not adopted variable targets in order to keep the assumptions relatively simple.

Summary results

Two final tables summarize combined costs for contraceptives, condoms for HIV protection, and reproductive health commodities, by region (Table C16) and by UNFPA region (Table C17).

Figure C4. Percent change in 2015 commodity cost with alternative assumptions, by region
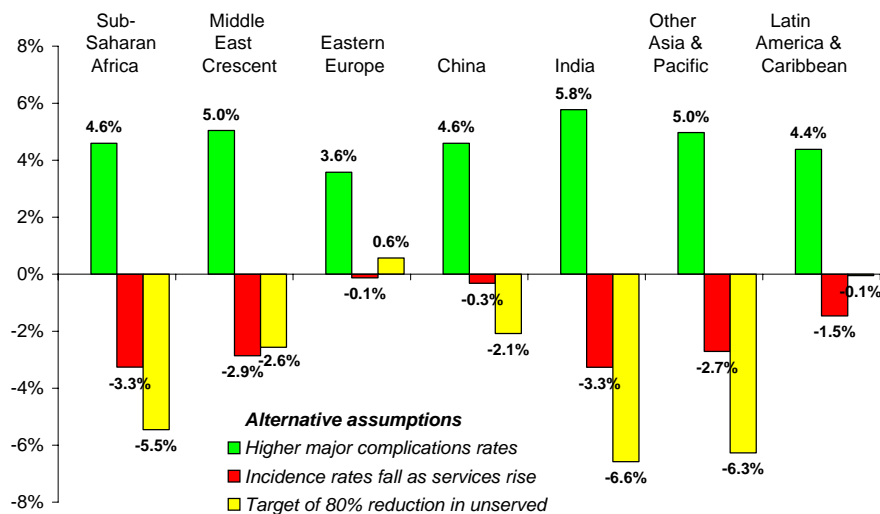
Table C1. Reproduic health conditions covered, and how cases are estimated

Condition [a]	Basis for estimating annual cases [b]
Antenatal care and normal delivery	
1 Basic antenatal care (ANC): Iron and folate supplementation, hookworm treatment, tetanus toxoid injections, pregnancy and hemoglobin blood tests, RPR syphilis test	Annual births (United Nations 2003) x 1.05 to allow for some pregnancies not carried to term
2 Malaria prevention: Chemoprophylaxis and insecticide-treated bed nets	All ANC cases where malaria prevalence is >= 0.5 per cent in the general population, none where prevalence is < 0.1 per cent, and a proportional number where prevalence is in between
3 Malaria treatment	All ANC cases x country-specific malaria prevalence
4 Normal delivery: Requires trained birth attendant	Annual births minus cases of assisted vaginal delivery and Caesarian section (below)
Major obstetric complications	
5 Maternal haemorrhage	Births x regional incidence ratios to births derived from Global Burden of Disease (GBD) data (Mathers et al. 2002)
6 Maternal sepsis	Births x regional incidence ratios to births derived from GBD, adjusted for total in AbouZahr (2003); declines to 3% of births with 100% service coverage of normal deliveries
7 Hypertensive disorders	Births x regional incidence ratios to births from GBD, adjusted for total in AbouZahr (2003)
8 Obstructed labour	Births x regional incidence ratios to births from GBD, adjusted for total in AbouZahr (2003)
9 Post-abortion complications	Females 15-44 x regional incidence of unsafe abortion (Ahman and Shah 2004) x 20% assumed to develop complications
10 Prolonged labour: Exceeding 12 hours, but excluding obstructed labour	1.1 x cases of obstructed labour
11 Assisted vaginal delivery: Forceps or vacuum extraction	10% of cases of obstructed labour + 50% of prolonged labour + 11% of all other births
12 Caesarian section	90% of cases of obstructed labour + 30% of prolonged labour + 4% of all other births
Other complications	
13 Urinary tract infection	25% of births
14 Mastitis	15% of births
15 Obstetric fistula: current cases only	1% of cases of obstructed labour; declines to 0 with 100% service coverage of obstructed labour
Sexually transmitted infections	
16 Chlamydia	Females 15-49 x regional incidence for adult women + males 15-49 x regional incidence for adult men (WHO 2001); declines to 3% for each sex (if not already lower) with 100% condom protection in risky sex
17 Gonorrhea	Females x regional incidence + males x regional incidence; declines to 1% with 100% condom protection in risky sex
18 Syphilis	Females x regional incidence + males x regional incidence; declines to 0.1% with 100% condom protection in risky sex
19 Trichomoniasis	Females x regional incidence + males x regional incidence; declines to 5% with 100% condom protection in risky sex
20 Pelvic inflammatory disease	Females x regional incidence; declines to 1% of females 15-49, if not already lower, with 100% service coverage of maternal sepsis and 100% condom coverage of gonorrhea and chlamydia,
Newborn infections	
21 Neonatal sepsis	0.5% of births, declines to 0.3% with 100% coverage of normal deliveries
22 ophthalmia neonatorum prevention	All births
23 Congenital syphilis	Births x 40% of syphilis prevalence among adult women; adult prevalence assumed to decline to 0.03% with 100% condom protection in risky sex
24 HIV prevention: Prevention of mother-to-child transmission (PMTCT)	Births x HIV prevalence among women 15-49 (UNAIDS 2004); assumed to decline to 0.12% of births with 100% condom protection in risky sex

a Conditions listed are mainly health disorders, but a few are treatments, preventive or curative, that may be packaged together or may serve multiple purposes.
b Where no trend is indicated, the same formula is applied throughout the projections.

Table C2. Incidence rates for major obstetric complications

WHO region	Per 1,000 births				Post-abortion complications (per 1,000 females 15-44)
	Haemorrhage	Sepsis	Hypertensive disorders	Obstructed labour	
World	43.3	55.3	51.5	58.9	17.3
High mortality regions (B-E)	44.3	57.6	55.0	61.3	18.8
Africa D	48.4	62.0	61.1	65.7	24
Africa E	51.1	65.0	64.3	66.2	28
Americas A	31.4	30.1	19.3	38.8	0
Americas B	34.2	57.8	42.8	51.9	30
Americas D	42.7	46.0	64.4	66.0	30
Eastern Mediterranean B	56.4	72.0	47.0	57.9	19
Eastern Mediterranean D	55.0	78.0	76.5	55.6	26
Europe A	34.7	32.7	21.3	38.4	0
Europe B	39.9	50.8	23.3	43.1	5
Europe C	29.7	40.6	18.7	33.8	6
South and East Asia B	51.2	55.1	51.2	72.2	23
South and East Asia D	39.4	60.0	58.6	68.3	21
Western Pacific A	33.5	32.7	20.8	42.3	0
Western Pacific B	41.6	39.8	41.8	52.9	2
World (AbouZahr 2003) [a]		44	32	46	

Note: To give lower total complications, regional rates are adjusted by the ratio of the last row to the first, where an entry appears in the last row.

Sources: Except for the last row, calculated in Bulatao (2004) from data in Mathers et al. (2002). Unsafe abortion, however, is based on Åhman and Shah (2004), with the additional assumption of 20 per cent complications in cases of unsafe abortion.

a The world rate for haemorrhage from this source, of 105 per thousand births, is not used in the calculations here, nor the rate for unsafe abortion of 148 per thousand births (not women).

Table C3. Incidence rates for sexually transmitted infections and pelvic inflammatory disease (per thousand individuals 15-49)

Region	Chlamydia		Gonorrhea		Syphilis		Trichomoniasis		Pelvic inflammatory disease	Syphilis prevalence, females[a]
	Females	Males	Females	Males	Females	Males	Females	Males		
World	32.7	26.5	22.0	18.1	3.5	4.1	57.3	54.2	112.4	7.7
Australia & New Zealand	29.1	23.8	10.3	10.2	0.7	0.7	49.7	54.4	62.3	0.3
East Asia & Pacific	6.8	6.0	4.2	3.8	0.3	0.3	12.3	10.9	24.7	0.7
Eastern Europe & Central Asia	31.4	26.4	17.5	14.6	0.5	0.5	61.5	65.6	93.2	0.7
Latin America & Caribbean	37.4	31.2	29.3	24.3	9.4	12.2	64.2	70.8	119.1	12.0
Mideast & North Africa	16.9	19.0	8.0	8.8	2.0	2.2	27.5	25.0	59.9	2.5
Northern America	26.9	22.0	10.5	8.9	0.7	0.7	48.6	53.2	60.1	0.3
sub-Saharan Africa	58.6	55.6	62.9	59.5	12.0	15.6	113.4	117.7	252.5	30.1
South & Southeast Asia	50.2	37.4	31.6	23.9	3.9	4.3	83.9	71.8	168.5	10.0
Western Europe	29.5	22.4	6.3	4.8	0.7	0.6	51.0	54.2	59.1	0.3

Source: Calculated from WHO (2001) in Bulatao (2004).

a Used in calculating congenital syphilis.

Table C4. Assumed commodity cost per case of each condition

Condition	Cost ($)
Antenatal care and normal delivery	
Antenatal care	$4.81
Malaria prevention	$4.39
Malaria treatment	$4.85
Normal delivery	$3.41
Major obstetric complications	
Maternal haemorrhage	$37.38
Maternal sepsis	$22.96
Hypertensive disorders	$6.31
Obstructed labour	$7.84
Post-abortion complications	$8.51
Prolonged labour	$7.84
Assisted vaginal delivery	$4.04
Caesarian section	$11.09
Other complications	
Urinary tract infections	$0.30
Mastitis	$0.93
Obstetric fistula	$12.18
Sexually transmitted infections	
Chlamydia	$0.06
Gonorrhea	$0.02
Syphilis	$0.24
Trichomoniasis	$0.02
Pelvic inflammatory disease	$0.47
Newborn infections	
Neonatal sepsis	$2.40
Ophthalmia neonatorum	$0.03
Congenital syphilis	$1.83
HIV prevention *	$1.04

* A newer regimen costs $41.96. For specific commodities, see Annex D.

Table C5. Cases of each reproductive health condition, 2000-2015 (millions)

Condition	2000	2001	2002	2003	2004	2005	2006	2007
Antenatal care & normal delivery								
Antenatal care	128.60	128.83	129.08	129.35	129.64	129.95	130.44	130.94
Malaria prevention	34.07	34.46	34.86	35.27	35.69	36.12	36.44	36.76
Malaria treatment	2.02	2.05	2.08	2.11	2.14	2.17	2.20	2.23
Normal delivery	95.05	95.21	95.39	95.59	95.80	96.03	96.39	96.76
Major complications & other deliveries								
Maternal haemorrhage	5.40	5.41	5.43	5.44	5.46	5.48	5.51	5.53
Maternal sepsis	5.58	5.60	5.62	5.64	5.66	5.68	5.70	5.73
Hypertensive disorders	4.11	4.13	4.14	4.15	4.17	4.19	4.21	4.22
Obstructed labour	5.79	5.80	5.81	5.83	5.84	5.86	5.88	5.90
Post-abortion complications	3.78	3.86	3.93	4.01	4.08	4.16	4.23	4.30
Prolonged labour	6.37	6.38	6.40	6.41	6.43	6.45	6.47	6.50
Assisted vaginal delivery	15.90	15.93	15.96	15.99	16.03	16.07	16.13	16.19
Caesarian section	11.53	11.56	11.58	11.61	11.64	11.67	11.71	11.75
Other complications								
Urinary tract infection	30.62	30.67	30.73	30.80	30.87	30.94	31.06	31.18
Mastitis	18.37	18.40	18.44	18.48	18.52	18.56	18.63	18.71
Obstetric fistula	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08
Sexually transmitted infections & PID								
Chlamydia	84.63	86.37	88.07	89.76	91.42	93.07	94.71	96.32
Gonorrhea	61.18	62.47	63.76	65.04	66.30	67.56	68.82	70.08
Syphilis	11.87	12.14	12.40	12.66	12.92	13.18	13.44	13.70
Trichomoniasis	158.06	161.26	164.42	167.53	170.61	173.65	176.67	179.66
Pelvic inflammatory disease	16.10	16.44	16.77	17.10	17.42	17.74	18.06	18.38
Newborn infections								
Neonatal sepsis	0.61	0.61	0.61	0.62	0.62	0.62	0.62	0.62
Ophthalmia neonatorum	122.48	122.69	122.93	123.19	123.47	123.76	124.23	124.71
Congenital syphilis	0.59	0.60	0.60	0.61	0.61	0.62	0.62	0.63
HIV prevention	2.33	2.35	2.37	2.40	2.42	2.45	2.47	2.49

Condition	2008	2009	2010	2011	2012	2013	2014	2015
Antenatal care & normal delivery								
Antenatal care	131.46	131.99	132.54	132.68	132.83	132.99	133.16	133.34
Malaria prevention	37.09	37.43	37.78	37.98	38.20	38.42	38.65	38.89
Malaria treatment	2.25	2.28	2.31	2.34	2.36	2.38	2.40	2.43
Normal delivery	97.14	97.54	97.94	98.04	98.15	98.27	98.40	98.53
Major complications & other deliveries								
Maternal haemorrhage	5.56	5.58	5.61	5.62	5.63	5.64	5.65	5.66
Maternal sepsis	5.75	5.78	5.81	5.82	5.83	5.84	5.85	5.86
Hypertensive disorders	4.24	4.27	4.29	4.29	4.30	4.31	4.32	4.33
Obstructed labour	5.93	5.95	5.98	5.98	5.99	6.00	6.01	6.01
Post-abortion complications	4.37	4.44	4.51	4.58	4.64	4.71	4.77	4.84
Prolonged labour	6.52	6.55	6.57	6.58	6.59	6.60	6.61	6.62
Assisted vaginal delivery	16.26	16.32	16.39	16.41	16.43	16.45	16.47	16.49
Caesarian section	11.80	11.85	11.90	11.91	11.93	11.94	11.96	11.97
Other complications								
Urinary tract infection	31.30	31.43	31.56	31.59	31.63	31.66	31.70	31.75
Mastitis	18.78	18.86	18.93	18.95	18.98	19.00	19.02	19.05
Obstetric fistula	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Sexually transmitted infections & PID								
Chlamydia	97.91	99.47	100.99	102.46	103.90	105.31	106.70	108.08
Gonorrhea	71.32	72.54	73.75	74.94	76.11	77.26	78.41	79.56
Syphilis	13.96	14.21	14.47	14.72	14.97	15.22	15.47	15.72
Trichomoniasis	182.59	185.47	188.28	191.02	193.69	196.32	198.92	201.50
Pelvic inflammatory disease	18.69	19.00	19.29	19.58	19.87	20.15	20.42	20.70
Newborn infections								
Neonatal sepsis	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Ophthalmia neonatorum	125.20	125.71	126.23	126.36	126.50	126.66	126.82	126.99
Congenital syphilis	0.63	0.64	0.64	0.64	0.65	0.65	0.65	0.66
HIV prevention	2.51	2.53	2.55	2.56	2.58	2.59	2.60	2.62

Table C6. Cases for groups of reproductive health conditions by region, 2000-2015 (millions)

Condition and year	Developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
Antenatal care								
2000	128.60	28.95	13.08	3.40	19.78	27.66	23.35	12.38
2005	129.95	31.37	13.78	3.46	18.50	27.22	23.33	12.29
2010	132.54	33.49	14.46	3.45	19.00	26.81	23.21	12.11
2015	133.34	35.08	14.73	3.28	19.29	26.14	22.95	11.87
Normal delivery								
2000	95.05	21.23	9.78	2.61	14.80	20.19	17.20	9.24
2005	96.03	23.01	10.30	2.65	13.84	19.87	17.18	9.18
2010	97.94	24.56	10.80	2.65	14.21	19.57	17.10	9.04
2015	98.53	25.73	11.00	2.51	14.43	19.08	16.91	8.86
Major pregnancy complications								
2000	24.65	6.04	2.64	0.44	2.77	5.62	4.64	2.51
2005	25.36	6.58	2.83	0.44	2.61	5.64	4.71	2.56
2010	26.19	7.08	3.01	0.43	2.67	5.67	4.76	2.58
2015	26.70	7.50	3.11	0.41	2.70	5.63	4.77	2.58
Prolonged labour								
2000	6.37	1.55	0.57	0.10	0.86	1.55	1.20	0.55
2005	6.45	1.68	0.60	0.10	0.80	1.52	1.19	0.54
2010	6.57	1.79	0.64	0.10	0.82	1.50	1.19	0.54
2015	6.62	1.88	0.65	0.10	0.83	1.46	1.17	0.53
Assisted vaginal delivery								
2000	15.90	3.62	1.59	0.40	2.40	3.49	2.90	1.50
2005	16.07	3.93	1.67	0.40	2.24	3.43	2.90	1.49
2010	16.39	4.19	1.76	0.40	2.30	3.38	2.88	1.47
2015	16.49	4.39	1.79	0.38	2.34	3.29	2.85	1.44
Caesarian section								
2000	11.53	2.72	1.09	0.24	1.64	2.66	2.14	1.04
2005	11.67	2.94	1.15	0.24	1.54	2.62	2.13	1.03
2010	11.90	3.14	1.21	0.24	1.58	2.58	2.12	1.02
2015	11.97	3.29	1.24	0.23	1.60	2.52	2.09	1.00
Other complications								
2000	49.06	11.05	4.99	1.30	7.55	10.56	8.91	4.72
2005	49.58	11.97	5.26	1.32	7.06	10.39	8.90	4.69
2010	50.57	12.78	5.52	1.32	7.25	10.23	8.86	4.62
2015	50.87	13.39	5.62	1.25	7.36	9.97	8.76	4.53
Sexually transmitted infections (excluding pelvic inflammatory disease)								
2000	315.75	73.26	20.21	19.15	16.13	80.23	68.20	38.57
2005	347.46	83.29	23.01	18.87	16.71	88.51	75.32	41.75
2010	377.49	94.51	25.40	17.81	17.00	96.28	81.96	44.51
2015	404.87	107.19	27.18	16.66	16.69	103.15	87.32	46.69
Newborn infections (excluding ophthalmia prevention)								
2000	3.53	2.50	0.08	0.03	0.11	0.39	0.24	0.18
2005	3.69	2.66	0.09	0.03	0.10	0.38	0.24	0.18
2010	3.82	2.80	0.09	0.03	0.10	0.38	0.24	0.18
2015	3.91	2.90	0.10	0.03	0.10	0.37	0.24	0.17

Table C7. Cases covered by services, with coverage rising from current levels to 95 per cent by 2015, by condition (millions)

Condition	2000	2001	2002	2003	2004	2005	2006	2007
Antenatal care & normal delivery								
Antenatal care	87.20	89.66	92.15	94.67	97.22	99.80	102.55	105.33
Malaria prevention	24.05	24.87	25.70	26.56	27.45	28.36	29.19	30.04
Malaria treatment	1.52	1.57	1.62	1.67	1.72	1.77	1.83	1.88
Normal delivery	52.74	55.26	57.82	60.40	63.02	65.67	68.47	71.30
Major complications & other deliveries								
Maternal haemorrhage	2.19	2.39	2.59	2.79	3.00	3.21	3.42	3.64
Maternal sepsis	2.23	2.44	2.65	2.86	3.08	3.30	3.52	3.75
Hypertensive disorders	1.59	1.74	1.90	2.06	2.23	2.39	2.56	2.73
Obstructed labour	2.30	2.52	2.73	2.95	3.17	3.40	3.62	3.86
Post-abortion complications	1.60	1.76	1.93	2.11	2.29	2.48	2.67	2.86
Prolonged labour	2.53	2.77	3.01	3.25	3.49	3.73	3.99	4.24
Assisted vaginal delivery	6.55	7.12	7.70	8.28	8.87	9.46	10.08	10.70
Caesarian section	4.67	5.09	5.52	5.94	6.38	6.81	7.27	7.72
Other complications								
Urinary tract infection	12.69	13.79	14.89	16.01	17.13	18.27	19.45	20.64
Mastitis	7.62	8.27	8.94	9.61	10.28	10.96	11.67	12.38
Obstetric fistula	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05
Sexually transmitted infections & PID								
Chlamydia	35.61	39.31	43.12	47.05	51.09	55.25	59.53	63.92
Gonorrhea	25.05	27.78	30.60	33.50	36.50	39.60	42.79	46.08
Syphilis	5.05	5.58	6.12	6.69	7.27	7.87	8.49	9.13
Trichomoniasis	67.17	74.01	81.07	88.34	95.82	103.52	111.43	119.56
Pelvic inflammatory disease	6.63	7.34	8.08	8.84	9.62	10.43	11.26	12.11
Newborn infections								
Neonatal sepsis	0.25	0.28	0.30	0.32	0.34	0.37	0.39	0.41
Ophthalmia neonatorum	50.78	55.16	59.58	64.04	68.54	73.08	77.79	82.55
Congenital syphilis	0.20	0.23	0.26	0.28	0.31	0.34	0.36	0.39
HIV prevention	0.85	0.95	1.05	1.15	1.26	1.36	1.47	1.58

Condition	2008	2009	2010	2011	2012	2013	2014	2015
Antenatal care & normal delivery								
Antenatal care	108.14	111.00	113.88	116.44	119.01	121.60	124.21	126.85
Malaria prevention	30.91	31.80	32.72	33.53	34.36	35.21	36.08	36.96
Malaria treatment	1.93	1.99	2.04	2.09	2.15	2.20	2.25	2.31
Normal delivery	74.17	77.07	80.02	82.73	85.47	88.22	91.00	93.80
Major complications & other deliveries								
Maternal haemorrhage	3.86	4.08	4.30	4.51	4.73	4.94	5.16	5.38
Maternal sepsis	3.98	4.21	4.44	4.66	4.89	5.11	5.34	5.56
Hypertensive disorders	2.91	3.08	3.26	3.43	3.60	3.77	3.94	4.11
Obstructed labour	4.09	4.33	4.57	4.79	5.02	5.25	5.48	5.71
Post-abortion complications	3.06	3.27	3.48	3.69	3.91	4.13	4.36	4.59
Prolonged labour	4.50	4.76	5.02	5.27	5.52	5.78	6.03	6.29
Assisted vaginal delivery	11.32	11.96	12.60	13.20	13.81	14.43	15.04	15.66
Caesarian section	8.18	8.65	9.12	9.56	10.01	10.46	10.92	11.37
Other complications								
Urinary tract infection	21.84	23.05	24.28	25.45	26.61	27.79	28.97	30.16
Mastitis	13.10	13.83	14.57	15.27	15.97	16.67	17.38	18.10
Obstetric fistula	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.07
Sexually transmitted infections & PID								
Chlamydia	68.42	73.03	77.73	82.52	87.41	92.39	97.48	102.68
Gonorrhea	49.46	52.93	56.49	60.13	63.85	67.67	71.57	75.58
Syphilis	9.79	10.47	11.17	11.88	12.61	13.37	14.14	14.93
Trichomoniasis	127.89	136.41	145.12	154.01	163.07	172.31	181.76	191.43
Pelvic inflammatory disease	12.98	13.88	14.79	15.73	16.68	17.65	18.64	19.66
Newborn infections								
Neonatal sepsis	0.44	0.46	0.49	0.51	0.53	0.56	0.58	0.60
Ophthalmia neonatorum	87.35	92.22	97.13	101.78	106.45	111.15	115.88	120.64
Congenital syphilis	0.42	0.45	0.48	0.51	0.54	0.56	0.59	0.62
HIV prevention	1.69	1.80	1.92	2.03	2.14	2.25	2.37	2.49

Table C8. Commodity cost for covered cases, by condition, 2000-2015 (million U.S. dollars)

Condition	2000	2001	2002	2003	2004	2005	2006	2007
All conditions	1,007.80	1,059.33	1,111.53	1,164.44	1,218.09	1,272.49	1,328.61	1,385.48
Antenatal care & normal delivery	711.77	735.97	760.53	785.47	810.79	836.51	863.11	890.10
Antenatal care	419.17	430.99	442.95	455.06	467.32	479.75	492.95	506.31
Malaria prevention	105.58	109.15	112.82	116.59	120.48	124.47	128.10	131.83
Malaria treatment	7.39	7.62	7.86	8.10	8.35	8.61	8.86	9.11
Normal delivery	179.63	188.22	196.91	205.72	214.63	223.67	233.20	242.84
Major complications & other deliveries	272.91	298.03	323.44	349.14	375.13	401.45	428.52	455.92
Maternal haemorrhage	81.91	89.32	96.81	104.39	112.04	119.80	127.80	135.89
Maternal sepsis	51.21	56.00	60.85	65.76	70.72	75.74	80.87	86.05
Hypertensive disorders	10.00	11.00	12.00	13.02	14.05	15.09	16.15	17.23
Obstructed labour	18.06	19.75	21.44	23.16	24.89	26.64	28.43	30.25
Post-abortion complications	13.58	14.98	16.44	17.93	19.47	21.06	22.68	24.35
Prolonged labour	19.87	21.72	23.59	25.47	27.38	29.30	31.28	33.28
Assisted vaginal delivery	26.48	28.79	31.13	33.48	35.85	38.25	40.73	43.24
Caesarian section	51.79	56.46	61.18	65.93	70.73	75.58	80.58	85.63
Other complications	11.29	12.27	13.26	14.25	15.25	16.27	17.32	18.38
Urinary tract infection	3.82	4.15	4.48	4.81	5.15	5.49	5.85	6.21
Mastitis	7.12	7.73	8.35	8.98	9.61	10.24	10.90	11.57
Obstetric fistula	0.36	0.39	0.43	0.46	0.49	0.53	0.57	0.60
Sexually transmitted infections	8.34	9.22	10.13	11.06	12.03	13.02	14.04	15.09
Chlamydia	2.00	2.21	2.42	2.64	2.87	3.10	3.34	3.59
Gonorrhea	0.59	0.65	0.72	0.78	0.85	0.93	1.00	1.08
Syphilis	1.23	1.35	1.49	1.62	1.76	1.91	2.06	2.22
Trichomoniasis	1.40	1.55	1.69	1.85	2.00	2.16	2.33	2.50
Pelvic inflammatory disease	3.13	3.47	3.81	4.17	4.54	4.92	5.31	5.71
Newborn infections	3.49	3.83	4.18	4.53	4.89	5.25	5.62	5.99
Neonatal sepsis	0.61	0.66	0.72	0.77	0.82	0.88	0.93	0.99
Ophthalmia neonatorum	1.62	1.77	1.91	2.05	2.19	2.34	2.49	2.64
Congenital syphilis	0.37	0.42	0.47	0.52	0.57	0.62	0.67	0.72
HIV prevention	0.88	0.98	1.09	1.19	1.30	1.42	1.53	1.64

Condition	2008	2009	2010	2011	2012	2013	2014	2015
All conditions	1,443.14	1,501.60	1,560.88	1,615.81	1,671.22	1,727.11	1,783.51	1,840.42
Antenatal care & normal delivery	917.49	945.29	973.51	998.83	1,024.40	1,050.22	1,076.29	1,102.64
Antenatal care	519.85	533.56	547.44	559.71	572.08	584.53	597.09	609.75
Malaria prevention	135.66	139.59	143.63	147.19	150.83	154.55	158.35	162.23
Malaria treatment	9.38	9.64	9.92	10.16	10.41	10.67	10.93	11.19
Normal delivery	252.61	262.50	272.52	281.77	291.08	300.47	309.93	319.47
Major complications & other deliveries	483.66	511.75	540.19	567.25	594.49	621.94	649.59	677.46
Maternal haemorrhage	144.09	152.39	160.80	168.74	176.74	184.80	192.91	201.09
Maternal sepsis	91.29	96.60	101.98	107.06	112.18	117.33	122.51	127.74
Hypertensive disorders	18.32	19.43	20.54	21.61	22.68	23.76	24.84	25.94
Obstructed labour	32.09	33.94	35.82	37.60	39.39	41.19	43.00	44.83
Post-abortion complications	26.06	27.80	29.59	31.41	33.27	35.17	37.11	39.08
Prolonged labour	35.30	37.34	39.40	41.36	43.33	45.31	47.30	49.31
Assisted vaginal delivery	45.78	48.34	50.93	53.38	55.85	58.33	60.82	63.33
Caesarian section	90.74	95.91	101.13	106.07	111.05	116.05	121.08	126.15
Other complications	19.45	20.53	21.63	22.66	23.71	24.75	25.81	26.87
Urinary tract infection	6.57	6.93	7.30	7.65	8.00	8.36	8.71	9.07
Mastitis	12.24	12.93	13.61	14.27	14.92	15.58	16.24	16.91
Obstetric fistula	0.64	0.67	0.71	0.75	0.78	0.82	0.85	0.89
Sexually transmitted infections	16.17	17.27	18.40	19.56	20.74	21.94	23.17	24.43
Chlamydia	3.84	4.10	4.36	4.63	4.90	5.18	5.47	5.76
Gonorrhea	1.16	1.24	1.32	1.41	1.49	1.58	1.67	1.77
Syphilis	2.38	2.54	2.71	2.88	3.06	3.24	3.43	3.62
Trichomoniasis	2.67	2.85	3.03	3.22	3.41	3.60	3.80	4.00
Pelvic inflammatory disease	6.13	6.55	6.98	7.42	7.87	8.33	8.80	9.28
Newborn infections	6.37	6.75	7.14	7.51	7.89	8.26	8.64	9.03
Neonatal sepsis	1.05	1.11	1.17	1.22	1.28	1.34	1.39	1.45
Ophthalmia neonatorum	2.80	2.95	3.11	3.26	3.41	3.56	3.71	3.86
Congenital syphilis	0.77	0.82	0.88	0.93	0.98	1.03	1.09	1.14
HIV prevention	1.75	1.87	1.99	2.10	2.22	2.34	2.46	2.58

Table C9. Cost of reproductive health commodities by region, 2000-2015 (million U.S. dollars)

Year	Developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
2000	1,007.8	244.3	116.4	36.2	155.9	159.3	160.2	135.5
2001	1,059.3	263.1	121.7	36.5	158.5	171.2	170.6	137.7
2002	1,111.5	282.4	127.1	36.8	161.1	183.1	181.1	139.9
2003	1,164.4	302.4	132.6	37.1	163.6	194.9	191.6	142.2
2004	1,218.1	323.1	138.3	37.4	165.9	206.7	202.2	144.4
2005	1,272.5	344.5	144.1	37.8	168.2	218.4	212.9	146.6
2006	1,328.6	365.2	149.9	38.0	173.6	230.1	223.3	148.6
2007	1,385.5	386.6	155.8	38.1	179.0	241.8	233.7	150.5
2008	1,443.1	408.5	161.8	38.3	184.5	253.4	244.1	152.5
2009	1,501.6	431.0	168.0	38.5	190.0	264.9	254.7	154.5
2010	1,560.9	454.2	174.3	38.7	195.6	276.4	265.2	156.4
2011	1,615.8	476.0	179.6	38.5	200.8	287.3	275.4	158.2
2012	1,671.2	498.3	184.9	38.3	206.0	298.1	285.6	160.0
2013	1,727.1	521.0	190.4	38.1	211.2	308.8	295.9	161.7
2014	1,783.5	544.3	195.9	37.9	216.5	319.4	306.1	163.5
2015	1,840.4	568.0	201.4	37.7	221.7	330.0	316.4	165.2

Table C10. Cost of reproductive health commodities by group of conditions and region, 2000-2015 (million U.S. dollars)

Condition and year or period	Developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
Antenatal care (including malaria)								
2000	532.14	157.72	49.98	16.12	71.32	79.12	91.41	66.46
2005	612.84	195.70	60.27	16.39	72.64	93.36	105.34	69.14
2010	700.99	235.61	71.57	16.37	80.67	107.18	118.46	71.14
2015	783.17	274.84	81.67	15.54	88.08	119.38	131.04	72.63
Normal delivery								
2000	179.63	30.04	24.55	8.81	35.27	29.09	25.37	26.49
2005	223.67	46.28	28.33	8.96	36.93	40.52	35.20	27.46
2010	272.52	64.31	32.39	8.95	41.95	51.61	45.10	28.22
2015	319.47	83.25	35.70	8.50	46.68	61.74	54.77	28.84
Major complications and prolonged labour								
2000	194.63	37.83	29.05	6.74	31.46	33.32	28.46	27.77
2005	287.62	68.53	38.70	7.42	37.44	55.10	47.78	32.64
2010	388.13	103.13	49.20	8.00	46.58	76.61	67.35	37.26
2015	487.98	140.15	58.98	8.20	55.50	96.89	86.62	41.65
Assisted vaginal delivery								
2000	26.48	4.55	3.54	1.19	5.09	4.47	3.81	3.83
2005	38.25	8.28	4.62	1.32	6.05	7.33	6.21	4.44
2010	50.93	12.45	5.80	1.43	7.53	10.10	8.61	5.02
2015	63.33	16.86	6.88	1.46	8.98	12.65	10.95	5.55
Caesarian section								
2000	51.79	9.34	6.66	1.95	9.58	9.38	7.67	7.22
2005	75.58	17.01	8.73	2.16	11.38	15.36	12.53	8.41
2010	101.13	25.60	10.98	2.34	14.16	21.17	17.36	9.52
2015	126.15	34.70	13.03	2.40	16.90	26.53	22.05	10.54
Other complications								
2000	11.29	1.92	1.53	0.53	2.19	1.87	1.61	1.65
2005	16.27	3.48	1.99	0.59	2.61	3.06	2.63	1.91
2010	21.63	5.23	2.50	0.64	3.24	4.22	3.64	2.16
2015	26.87	7.09	2.96	0.65	3.87	5.29	4.63	2.38
Sexually transmitted infections (including pelvic inflammatory disease)								
2000	8.34	1.56	0.75	0.74	0.51	1.59	1.51	1.69
2005	13.02	2.91	1.02	0.80	0.67	2.92	2.60	2.11
2010	18.40	4.59	1.32	0.81	0.82	4.45	3.86	2.55
2015	24.43	6.70	1.61	0.82	0.95	6.13	5.22	3.00
Newborn infections (including prevention of ophthalmia neonatorum)								
2000	3.49	1.32	0.32	0.12	0.44	0.48	0.38	0.43
2005	5.25	2.26	0.42	0.13	0.53	0.79	0.62	0.50
2010	7.14	3.30	0.53	0.14	0.66	1.08	0.87	0.57
2015	9.03	4.38	0.63	0.14	0.78	1.36	1.10	0.63

Table C11. Cost of reproductive health commodities by group of conditions and region for five-year periods, 2001-2015 (million U.S. dollars)

Condition and year or period	Developing region	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
Antenatal care (including malaria)								
2001-2005	2,900.11	900.31	280.23	81.37	360.75	438.51	498.63	340.31
2006-2010	3,325.83	1,096.18	334.71	81.87	387.15	508.44	565.80	351.68
2011-2015	3,749.68	1,294.21	387.84	79.34	425.49	572.77	629.87	360.16
Normal delivery								
2001-2005	1,029.15	197.82	133.90	44.48	181.48	179.89	156.23	135.35
2006-2010	1,263.68	284.46	153.65	44.76	199.59	236.01	205.62	139.58
2011-2015	1,502.71	377.56	171.78	43.38	223.87	288.65	254.51	142.96
Major complications and prolonged labour								
2001-2005	1,249.81	279.21	173.73	35.74	175.61	232.07	200.02	153.43
2006-2010	1,737.04	444.46	224.59	38.86	214.46	340.15	297.44	177.08
2011-2015	2,238.61	625.09	275.11	40.61	259.56	444.18	394.52	199.53
Assisted vaginal delivery								
2001-2005	167.50	33.70	20.91	6.33	28.38	30.96	26.22	20.99
2006-2010	229.02	53.68	26.61	6.93	34.64	44.98	38.24	23.94
2011-2015	291.70	75.31	32.21	7.25	41.98	58.21	50.06	26.68
Caesarian section								
2001-2005	329.88	69.20	39.41	10.38	53.39	64.92	52.90	39.67
2006-2010	453.99	110.36	50.30	11.34	65.18	94.31	77.13	45.38
2011-2015	580.41	154.94	61.00	11.87	78.98	122.05	100.90	50.68
Other complications								
2001-2005	71.30	14.17	9.01	2.82	12.23	12.94	11.09	9.03
2006-2010	97.30	22.57	11.45	3.09	14.93	18.80	16.17	10.30
2011-2015	123.80	31.66	13.86	3.23	18.09	24.33	21.17	11.47
Sexually transmitted infections (including pelvic inflammatory disease)								
2001-2005	55.46	11.73	4.56	3.88	3.02	11.84	10.74	9.70
2006-2010	80.98	19.45	6.00	4.05	3.81	19.11	16.70	11.87
2011-2015	109.84	29.10	7.47	4.09	4.51	27.24	23.33	14.09
Newborn infections (including prevention of ophthalmia neonatorum)								
2001-2005	22.67	9.36	1.92	0.63	2.48	3.32	2.63	2.34
2006-2010	31.86	14.35	2.44	0.69	3.03	4.82	3.85	2.69
2011-2015	41.33	19.70	2.95	0.72	3.67	6.24	5.04	3.02

Table C12. Cost of reproductive health commodities by UNFPA region, 2000-2015 (million U.S. dollars)

Year	All UNFPA regions	Arab States/ Europe	Africa	Asia Pacific	Latin America
2000	1,001.3	138.1	225.1	504.1	134.1
2001	1,052.4	142.9	243.1	530.2	136.3
2002	1,104.1	147.8	261.7	556.2	138.4
2003	1,156.5	152.8	280.9	582.2	140.6
2004	1,209.6	157.9	300.8	608.2	142.8
2005	1,263.5	163.1	321.3	634.2	145.0
2006	1,319.1	168.0	341.2	663.0	146.9
2007	1,375.4	172.9	361.8	691.9	148.8
2008	1,432.5	178.0	382.9	720.9	150.8
2009	1,490.4	183.1	404.6	750.0	152.7
2010	1,549.1	188.3	427.0	779.2	154.6
2011	1,603.4	192.5	448.0	806.6	156.3
2012	1,658.2	196.8	469.4	834.0	158.1
2013	1,713.5	201.1	491.3	861.3	159.8
2014	1,769.2	205.5	513.6	888.7	161.5
2015	1,825.5	209.8	536.5	916.0	163.2

Table C13. Alternative estimates of cases and commodity costs in developing regions given 25 per cent higher rates for some major obstetric complications, 2000-2015

	Maternal sepsis	Hypertensive disorders	Obstructed labour	Prolonged labour	Assisted vaginal delivery	Caesarian section	Normal delivery
Cases (millions)							
2000	7.02	6.61	7.41	8.16	16.58	13.40	92.50
2001	7.04	6.64	7.43	8.17	16.61	13.42	92.66
2002	7.07	6.66	7.45	8.19	16.64	13.45	92.84
2003	7.09	6.68	7.47	8.21	16.68	13.48	93.03
2004	7.12	6.71	7.49	8.23	16.72	13.52	93.23
2005	7.15	6.73	7.51	8.26	16.76	13.55	93.45
2006	7.18	6.76	7.53	8.29	16.82	13.60	93.80
2007	7.21	6.79	7.56	8.32	16.89	13.66	94.16
2008	7.24	6.83	7.59	8.35	16.95	13.71	94.54
2009	7.27	6.86	7.62	8.39	17.02	13.76	94.92
2010	7.31	6.89	7.66	8.42	17.09	13.82	95.31
2011	7.32	6.91	7.66	8.43	17.11	13.84	95.41
2012	7.33	6.92	7.67	8.44	17.13	13.85	95.52
2013	7.34	6.93	7.68	8.45	17.15	13.87	95.63
2014	7.36	6.95	7.69	8.46	17.17	13.89	95.76
2015	7.37	6.96	7.70	8.47	17.20	13.91	95.88
Commodity costs (million U.S. dollars)							
2000	64.44	16.09	23.14	25.45	27.58	60.01	175.03
2001	70.48	17.69	25.29	27.82	29.99	65.45	183.38
2002	76.58	19.30	27.47	30.21	32.43	70.93	191.82
2003	82.76	20.93	29.66	32.63	34.88	76.47	200.37
2004	89.00	22.59	31.88	35.07	37.36	82.06	209.04
2005	95.32	24.26	34.12	37.53	39.87	87.70	217.82
2006	101.77	25.97	36.42	40.06	42.46	93.52	227.08
2007	108.29	27.71	38.75	42.62	45.08	99.40	236.45
2008	114.89	29.46	41.10	45.21	47.72	105.34	245.94
2009	121.57	31.24	43.48	47.82	50.40	111.35	255.55
2010	128.34	33.04	45.88	50.47	53.10	117.43	265.29
2011	134.73	34.75	48.16	52.98	55.66	123.19	274.27
2012	141.17	36.47	50.46	55.50	58.24	128.97	283.32
2013	147.65	38.20	52.76	58.04	60.82	134.80	292.44
2014	154.18	39.95	55.08	60.59	63.43	140.65	301.63
2015	160.75	41.71	57.42	63.16	66.05	146.55	310.90

Table C14. Alternative estimates of cases and commodity cost in developing regions if incidence rates decline as services spread, selected conditions, 2000-2015

	Maternal sepsis	Obstetric fistula	Chla-mydia	Gonor-rhea	Syphilis	Tricho-moniasis	Pelvic inflam-matory disease	Neonatal sepsis	Con-genital syphilis	HIV preven-tion
Cases (millions)										
2000	5.58	0.07	84.63	61.18	11.87	158.06	16.10	0.61	0.59	2.33
2001	5.49	0.07	85.42	61.79	11.74	159.03	16.16	0.60	0.57	2.26
2002	5.40	0.07	86.15	62.35	11.58	159.84	16.21	0.59	0.55	2.19
2003	5.32	0.06	86.80	62.87	11.40	160.53	16.23	0.58	0.54	2.12
2004	5.23	0.06	87.40	63.36	11.21	161.08	16.24	0.56	0.52	2.05
2005	5.14	0.05	87.94	63.81	11.00	161.50	16.24	0.55	0.50	1.98
2006	5.05	0.05	88.41	64.22	10.77	161.80	16.22	0.54	0.48	1.90
2007	4.96	0.04	88.83	64.59	10.53	161.97	16.18	0.53	0.46	1.82
2008	4.87	0.04	89.18	64.92	10.26	161.99	16.13	0.52	0.43	1.74
2009	4.78	0.03	89.45	65.21	9.98	161.86	16.06	0.51	0.41	1.66
2010	4.69	0.03	89.64	65.44	9.68	161.58	15.97	0.50	0.39	1.58
2011	4.59	0.03	89.75	65.62	9.36	161.13	15.85	0.48	0.37	1.48
2012	4.48	0.02	89.79	65.75	9.01	160.53	15.72	0.47	0.34	1.39
2013	4.37	0.02	89.75	65.83	8.65	159.79	15.58	0.46	0.32	1.30
2014	4.27	0.01	89.66	65.88	8.28	158.93	15.41	0.45	0.30	1.21
2015	4.16	0.01	89.52	65.89	7.88	157.96	15.23	0.43	0.27	1.11
Commodity costs (million U.S. dollars)										
2000	51.20	0.36	2.00	0.59	1.23	1.40	3.13	0.61	0.37	0.88
2001	55.09	0.37	2.18	0.64	1.31	1.53	3.42	0.65	0.40	0.95
2002	58.82	0.38	2.37	0.70	1.39	1.65	3.70	0.69	0.43	1.01
2003	62.39	0.38	2.56	0.76	1.46	1.77	3.98	0.72	0.46	1.06
2004	65.80	0.38	2.75	0.82	1.53	1.90	4.26	0.76	0.48	1.10
2005	69.05	0.37	2.94	0.88	1.60	2.02	4.54	0.79	0.50	1.15
2006	72.17	0.36	3.13	0.94	1.65	2.14	4.80	0.82	0.51	1.18
2007	75.13	0.35	3.32	1.00	1.70	2.26	5.07	0.85	0.52	1.20
2008	77.91	0.33	3.51	1.06	1.75	2.38	5.32	0.88	0.53	1.22
2009	80.52	0.31	3.70	1.12	1.79	2.50	5.57	0.90	0.53	1.23
2010	82.95	0.28	3.88	1.17	1.81	2.61	5.81	0.92	0.53	1.23
2011	84.91	0.25	4.07	1.23	1.83	2.72	6.04	0.94	0.53	1.22
2012	86.68	0.21	4.25	1.29	1.84	2.83	6.25	0.96	0.52	1.20
2013	88.24	0.17	4.42	1.35	1.84	2.94	6.46	0.97	0.51	1.17
2014	89.60	0.13	4.60	1.41	1.84	3.04	6.65	0.98	0.49	1.14
2015	90.76	0.08	4.77	1.46	1.82	3.14	6.83	0.99	0.47	1.10

Table C15. Alternative estimates of total commodity cost by region, 2000-2015 (million U.S. dollars)

	Developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
With 25 per cent higher rates of some major obstetric complications								
2000	1,042.5	251.1	121.3	37.3	161.4	165.8	165.2	140.4
2001	1,097.5	271.0	126.9	37.6	164.3	178.6	176.3	142.7
2002	1,153.2	291.5	132.6	37.9	167.1	191.4	187.5	145.1
2003	1,209.6	312.7	138.5	38.3	169.8	204.1	198.8	147.5
2004	1,266.8	334.5	144.5	38.6	172.5	216.7	210.1	149.9
2005	1,324.8	357.1	150.7	39.0	175.0	229.3	221.5	152.3
2006	1,384.6	379.1	156.8	39.2	180.7	241.9	232.6	154.4
2007	1,445.2	401.7	163.1	39.4	186.4	254.4	243.7	156.5
2008	1,506.7	425.0	169.5	39.6	192.3	266.8	254.9	158.7
2009	1,569.0	448.8	176.0	39.8	198.1	279.2	266.1	160.8
2010	1,632.1	473.4	182.7	40.0	204.1	291.5	277.4	162.9
2011	1,690.7	496.5	188.4	39.8	209.6	303.2	288.3	164.8
2012	1,749.8	520.1	194.1	39.6	215.1	314.8	299.2	166.8
2013	1,809.4	544.3	199.8	39.4	220.7	326.3	310.2	168.7
2014	1,869.5	568.9	205.7	39.2	226.3	337.7	321.1	170.6
2015	1,930.2	594.0	211.6	39.1	231.9	349.0	332.1	172.5
With incidence rates declining as services spread								
2000	1,007.8	244.3	116.4	36.2	155.9	159.3	160.2	135.5
2001	1,058.2	262.7	121.5	36.5	158.5	171.0	170.5	137.6
2002	1,109.0	281.6	126.7	36.8	161.0	182.5	180.7	139.7
2003	1,160.2	301.0	132.0	37.1	163.5	193.9	191.0	141.8
2004	1,211.9	321.0	137.4	37.4	165.8	205.2	201.2	143.9
2005	1,264.1	341.5	142.9	37.8	168.1	216.4	211.5	146.0
2006	1,317.7	361.3	148.4	37.9	173.4	227.5	221.4	147.8
2007	1,371.8	381.6	153.9	38.1	178.8	238.5	231.3	149.6
2008	1,426.3	402.3	159.6	38.3	184.2	249.4	241.2	151.4
2009	1,481.4	423.5	165.3	38.5	189.7	260.1	251.1	153.2
2010	1,537.0	445.2	171.2	38.6	195.2	270.8	261.0	155.0
2011	1,587.9	465.4	176.0	38.4	200.3	280.7	270.4	156.6
2012	1,639.1	485.9	180.8	38.3	205.5	290.6	279.8	158.2
2013	1,690.4	506.8	185.8	38.1	210.6	300.3	289.2	159.7
2014	1,741.9	528.0	190.7	37.9	215.8	309.8	298.5	161.3
2015	1,793.6	549.5	195.7	37.7	221.0	319.2	307.8	162.8
With targeted coverage of 80 per cent of those originally unserved								
2000	1,007.8	244.3	116.4	36.2	155.9	159.3	160.2	135.5
2001	1,054.3	261.4	121.3	36.5	158.2	169.7	169.4	137.7
2002	1,101.4	279.0	126.4	36.8	160.5	180.1	178.6	140.0
2003	1,149.1	297.2	131.7	37.2	162.7	190.5	187.8	142.2
2004	1,197.5	316.0	137.0	37.5	164.7	200.7	197.1	144.4
2005	1,246.6	335.4	142.5	37.8	166.8	211.0	206.5	146.6
2006	1,297.4	354.2	147.9	38.0	171.8	221.2	215.5	148.6
2007	1,348.8	373.5	153.5	38.2	176.9	231.4	224.6	150.5
2008	1,400.9	393.4	159.2	38.4	182.1	241.5	233.8	152.5
2009	1,453.7	413.7	165.0	38.6	187.3	251.6	242.9	154.5
2010	1,507.3	434.7	170.9	38.8	192.6	261.7	252.2	156.4
2011	1,556.6	454.3	175.9	38.6	197.4	271.1	261.0	158.2
2012	1,606.3	474.3	180.9	38.5	202.3	280.5	269.9	159.9
2013	1,656.5	494.8	185.9	38.3	207.2	289.9	278.7	161.7
2014	1,707.1	515.7	191.1	38.1	212.2	299.1	287.6	163.4
2015	1,758.2	537.0	196.3	37.9	217.1	308.3	296.6	165.1

Table C16. Combined contraceptive, condom, and reproductive health commodity cost by region, 2000-2015 (million U.S. dollars)

Year	All developing regions	Sub-Saharan Africa	Middle East Crescent	Eastern Europe	China	India	Other Asia & Pacific	Latin America & Caribbean
2000	1,838.2	320.3	179.5	106.3	338.6	281.2	355.0	257.3
2001	1,934.8	346.9	191.1	108.5	346.9	300.9	373.2	267.2
2002	2,031.7	374.5	201.5	110.9	355.2	320.9	391.4	277.3
2003	2,130.4	403.0	212.1	113.2	363.6	341.1	409.8	287.6
2004	2,232.2	432.9	223.2	115.5	372.1	361.6	428.5	298.4
2005	2,336.2	463.8	234.7	117.7	380.7	382.4	447.3	309.5
2006	2,442.1	495.1	246.1	119.5	392.2	403.1	465.9	320.2
2007	2,549.8	527.5	257.9	121.1	403.7	424.0	484.5	331.1
2008	2,659.1	561.0	269.9	122.6	415.2	445.0	503.3	342.1
2009	2,769.8	595.6	282.1	124.1	426.5	466.1	522.2	353.3
2010	2,881.8	631.2	294.5	125.5	437.7	487.3	541.1	364.5
2011	2,990.7	667.0	305.9	126.4	448.2	507.9	559.6	375.7
2012	3,100.0	703.6	317.3	127.3	458.4	528.5	578.0	386.8
2013	3,209.4	741.1	328.9	128.0	468.2	549.1	596.3	397.9
2014	3,318.7	779.5	340.4	128.7	477.4	569.4	614.4	408.8
2015	3,427.7	818.6	352.0	129.3	486.1	589.6	632.5	419.6

Table C17. Combined contraceptive, condom, and reproductive health commodity cost by UNFPA region, 2000-2015 (million U.S. dollars)

Year	All UNFPA regions	Arab States/ Europe	Africa	Asia Pacific	Latin America
2000	1,831.5	256.7	299.4	1,019.7	255.7
2001	1,927.6	268.9	325.0	1,068.0	265.5
2002	2,023.9	280.0	351.6	1,116.7	275.6
2003	2,122.0	291.3	379.2	1,165.7	285.9
2004	2,223.2	302.9	407.9	1,215.8	296.6
2005	2,326.6	314.8	437.8	1,266.4	307.5
2006	2,431.9	326.1	468.1	1,319.5	318.2
2007	2,538.9	337.4	499.4	1,373.1	329.0
2008	2,647.5	348.8	531.8	1,426.9	339.9
2009	2,757.5	360.4	565.3	1,480.9	351.0
2010	2,868.8	372.0	599.8	1,534.9	362.1
2011	2,977.0	382.6	634.4	1,586.8	373.2
2012	3,085.6	393.3	669.9	1,638.1	384.3
2013	3,194.2	403.9	706.2	1,688.9	395.3
2014	3,302.8	414.4	743.3	1,738.9	406.1
2015	3,411.0	424.9	781.2	1,788.1	416.8

Treatment and commodities	Per cent to treat	No. of units x times/day x days/episode	Unit cost ($)	Average episode cost ($)
ANTENATAL CARE				**$4.81**
Drugs and supplements				
Ferrous salt + folic acid, tablet, 200+0.25 mg (60 mg iron) (6 months)	100%	1 x 2 x 180	0.001	0.53
Multivitamin, tablet (6 months)	100%	1 x 1 x 180	0.003	0.52
Mebendazole, chewable tablet, 100 mg (hookworm treatment)	30%	1 x 2 x 3	0.006	0.01
Tetanus toxoid, injection	100%	1 x 1 x 2	0.042	0.08
Syringe, disposable, 2 ml, with needle	100%	1 x 1 x 2	0.027	0.05
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Tests				
Lancet, blood, disposable (to take blood sample)	100%	1 x 1 x 1	0.010	0.01
Blood collection tube	100%	1 x 1 x 1	0.022	0.02
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Test, blood group, anti A + B, 10 ml	100%	1 x 1 x 1	0.017	0.02
Test, blood glucose	100%	1 x 1 x 1	0.208	0.21
Test, hemoglobin (anemia screening)	100%	1 x 1 x 1	0.852	0.85
Pregnancy test	100%	1 x 1 x 1	0.134	0.13
Test, rapid plasma reagin (RPR) (syphilis test)	100%	1 x 1 x 1	0.069	0.07
Test HIV 1 + 2, doublecheck, rapid test	100%	1 x 1 x 1	1.000	1.00
Test strips, urine (blood/bilirubin/urobilinogen/ketones/ protein/glucose/PH)	100%	1 x 1 x 4	0.099	0.40
Other				
Gloves, surgeon's, latex, size 7-1/2, disposable, sterile, pair (examination)	100%	1 x 1 x 4	0.190	0.76
Antenatal care record	100%	1 x 1 x 1	0.100	0.10
MALARIA PREVENTION IN PREGNANCY				**$4.39**
Sulfadoxine + pyrimethamine, tablet, 500 mg + 25 mg (intermittent preventive treatment [IPT] at least 2x during 2nd and 3rd trimester)	100%	1 x 1 x 6	0.023	0.14
Insecticide-treated net	100%	1 x 1 x 1	4.250	4.25
MALARIA TREATMENT IN PREGNANCY				**$4.85**
Quinine dihydrochloride, injection, 300 mg/ml in 1 ml ampoule (loading dose 20 mg/kg body weight)	25%	4 x 1 x 1	1.450	1.45
Sodium lactate (Ringer) + set, 500 ml	25%	1 x 1 x 1	0.385	0.10
Quinine dihydrochloride, injection, 300 mg/ml in 1 ml ampoule (maintenance dose 10 mg/kg over 4 hours, repeat every 8 hours)	25%	2 x 2 x 1	1.450	1.45
Sodium lactate (Ringer) + set, 500 ml	25%	1 x 2 x 1	0.385	0.19
Intravenous giving/infusion set	25%	1 x 1 x 1	0.220	0.06
Cannula, IV, 20 g, sterile, disposable	25%	1 x 1 x 1	0.480	0.12
Lancet, blood, disposable (to take blood sample)	25%	1 x 16 x 1	0.010	0.04
Alcohol swab	100%	1 x 16 x 1	0.020	0.32
Test, blood glucose (every hour during glucose IV)	25%	1 x 16 x 1	0.208	0.83
Quinine sulfate, tablet, 300 mg (10 mg/kg body weight)	25%	2 x 3 x 7	0.028	0.30
or				
Sulfadoxine + pyrimethamine, tablet, 500 mg + 25 mg (3 tablets as single dose)	0%	3 x 1 x 1	0.023	0.00
NORMAL DELIVERY				**$3.41**
Gloves, surgeon's, latex, size 7-1/2, disposable, sterile, pair	100%	1 x 4 x 1	0.190	0.76
Povidone iodine, solution, 10% (antiseptic)	100%	1 x 1 x 1	0.039	0.04
Clean delivery kit (soap, plastic sheeting, razor blade, umbilical tape, cotton wrap for newborn)	100%	1 x 1 x 1	1.370	1.37
Oxytocin, injection, 10 IU in 1 ml ampoule (to induce uterus contraction, IM)	100%	1 x 1 x 1	0.089	0.09
Syringe, disposable, 5 ml, with needle	100%	1 x 1 x 1	0.033	0.03
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Paracetamol, tablet, 500 mg (pain management after delivery)	100%	1 x 4 x 3	0.005	0.06
Episiotomy or tears				
Lidocaine HCL, injection, 2% in 50 ml vial (local anesthesia)	100%	1 x 1 x 1	0.519	0.52
Syringe, disposable, 10 ml, with needle	100%	1 x 1 x 1	0.041	0.04
Alcohol swab		1 x 1 x 1	0.020	0.00

Treatment and commodities	Per cent to treat	No. of units x times/day x days/episode	Unit cost ($)	Average episode cost ($)
Suture, catgut chromic 3/0, 1 x 150 cm	50%	1 x 1 x 1	0.548	0.27
Needle, suture, assorted sizes, cutting	50%	1 x 1 x 1	0.085	0.04
Gauze pad, 76 x 76 mm, sterile (dressing)	50%	1 x 1 x 1	0.024	0.01
Other				
Partograph (form to monitor progress of labour)	100%	1 x 1 x 1	0.050	0.05
Delivery record (for clinic)	100%	1 x 1 x 1	0.100	0.10
MATERNAL HAEMORRHAGE				**$37.38**
Oxytocin, injection, 10 IU in 1 ml ampoule (10 units IM)	100%	1 x 1 x 1	0.089	0.09
Syringe, disposable, 10 ml, without needle	100%	1 x 1 x 1	0.030	0.03
Needle, 21 g, disposable	100%	1 x 1 x 1	0.013	0.01
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Sodium lactate (Ringer) + set, 500 ml (to restore blood volume)	100%	6 x 1 x 1	0.385	2.31
Intravenous giving/infusion set	100%	1 x 1 x 1	0.220	0.22
Cannula, IV, 20 g, sterile, disposable	100%	1 x 1 x 1	0.480	0.48
Blood, one unit (in case of heavy blood loss)	25%	4 x 1 x 1	30.000	30.00
Catheter, urethral, Foley, Ch 12 (control of urine output)	100%	1 x 1 x 1	0.560	0.56
Bag, urine, 2000 ml (urine collection)	100%	1 x 1 x 1	0.180	0.18
Gloves, surgeon's, latex, size 6-1/2, disposable, sterile, pair	100%	1 x 1 x 1	0.190	0.19
If there are signs of infection				
Sodium chloride, injectable solution, 0.9% isotonic, 500 ml	10%	1 x 2 x 4	0.812	0.65
IV giving/infusion set, with needle	10%	1 x 1 x 1	0.169	0.02
Ampicillin, injection, 500 mg, vial (2 g IV every 6 hours until fever-free for 48 hours)	10%	4 x 4 x 4	0.101	0.64
Gentamycin, injection, 40 mg (as sulfate)/ml in 2 ml vial (5 mg/kg body weight IV every 24 hours)	10%	3 x 1 x 4	0.071	0.09
Metronidazole, injection, 500 mg in 100 ml vial (500 mg IV every 8 hours)	10%	1 x 3 x 4	0.582	0.70
After bleeding is controlled				
Lancet, blood, disposable (to take blood sample)	100%	1 x 1 x 1	0.010	0.01
Test, hemoglobin	100%	1 x 1 x 1	0.852	0.85
a) If HB < 7 g/dL (severe anemia)				
Ferrous salt + folic acid, tablet, 200+0.25 mg (60 mg iron) (first 3 months)	25%	2 x 1 x 90	0.001	0.07
Ferrous salt + folic acid, tablet, 200+0.25 mg (60 mg iron) (next 6 months)	25%	1 x 1 x 180	0.001	0.07
a) If HB between 7-11 g/dL				
Ferrous salt + folic acid, tablet, 200+0.25 mg (60 mg iron) (for 6 months)	75%	1 x 1 x 180	0.001	0.20
MATERNAL SEPSIS				**$22.96**
Antibiotics				
Ampicillin, injection, 500 mg, vial (2 g IV every 6 hours until fever-free for 48 hours)	100%	4 x 4 x 4	0.101	6.44
Gentamycin, injection, 40 mg (as sulfate)/ml in 2 ml vial (5 mg/kg body weight IV every 24 hours)	100%	7 x 1 x 4	0.071	1.99
Metronidazole, injection, 500 mg in 100 ml vial (500 mg IV every 8 hours)	100%	1 x 3 x 4	0.582	6.98
Sodium chloride, injectable solution, 0.9% isotonic, 500 ml (shock, IV fluid for antibiotics)	100%	1 x 2 x 4	0.812	6.50
IV giving/infusion set, with needle	100%	1 x 1 x 1	0.169	0.17
Lancet, blood, disposable (to take blood sample)	100%	1 x 1 x 1	0.010	0.01
Complete blood count	100%	1 x 1 x 1	0.100	0.10
Catheter, urethral, Foley, Ch 12 (control of urine output)	100%	1 x 1 x 1	0.560	0.56
Bag, urine, 2000 ml (urine collection)	100%	1 x 1 x 1	0.180	0.18
Oxygen, inhalation (medicinal gas) (shock, oxygen 3 hours at 6-8 liters/min)	25%	13.5 x 1 x 1	0.000	0.00
Paracetamol, tablet, 500 mg (pain management)	100%	1 x 4 x 2	0.005	0.04
HYPERTENSIVE DISORDERS				**$6.31**
Test strips, urinary protein	100%	1 x 1 x 1	0.032	0.03
Catheter, urethral, Foley, Ch 14	100%	1 x 1 x 1	0.530	0.53
Bag, urine, 2000 ml	100%	1 x 1 x 1	0.180	0.18
High blood pressure				
Hydralazine, 20 mg/ml, ampoule 1 ml (5 mg IV every 5 minutes until BP is lowered)	100%	0.25 x 4 x 1	1.260	1.26

Treatment and commodities	Per cent to treat	No. of units x times/day x days/episode	Unit cost ($)	Average episode cost ($)
Hydralazine, 20 mg/ml, ampoule 1 ml (repeat hourly as needed)	100%	0.25 x 8 x 1	1.260	2.52
Sodium lactate (Ringer) + set, 500 ml	100%	1 x 1 x 1	0.385	0.39
Intravenous giving/infusion set	100%	1 x 1 x 1	0.220	0.22
Cannula, IV, 20 g, sterile, disposable	100%	1 x 1 x 1	0.480	0.48
Convulsions				
Magnesium sulfate, injection, 500 mg/ml in 10 ml ampoule (loading dose, 4 g IV over 5 minutes)	20%	8 x 1 x 1	0.068	0.11
Sodium lactate (Ringer) + set, 500 ml	20%	1 x 2 x 2	0.385	0.31
Magnesium sulfate, injection, 500 mg/ml in 10 ml ampoule (loading dose, 5 g deep IM in each buttock, then every 4 hours alternating)	20%	0.5 x 10 x 1	0.068	0.07
Lidocaine HCL, injection, 2% in 20 ml vial (1 ml, in same syringe as magnesium sulfate, repeat every 4 hours)	20%	0.1 x 10 x 1	0.542	0.11
Syringe, disposable, 5 ml, without needle	20%	1 x 10 x 1	0.020	0.04
Needle, 21 g, disposable	20%	1 x 10 x 1	0.013	0.03
Alcohol swab	20%	1 x 10 x 1	0.020	0.04
Oxygen, inhalation (medicinal gas) (oxygen, 4-6 l/min for 2 hours [600 liters])	20%	6 x 1 x 1	0.000	0.00
PROLONGED OR OBSTRUCTED LABOUR				**$7.84**
Induction of contraction				
Oxytocin, injection, 10 IU in 1 ml ampoule (to induce labour)	100%	1 x 2 x 1	0.089	0.18
Sodium chloride, injectable solution, 0.9% isotonic, 500 ml	100%	1 x 1 x 1	0.812	0.81
IV giving/infusion set, with needle	100%	1 x 1 x 1	0.169	0.17
Cannula, IV, 20 g, sterile, disposable	50%	1 x 1 x 1	0.480	0.24
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Test strips, urine (blood/bilirubin/urobilinogen/ketones/ protein/glucose/PH) (to test for ketones)	100%	1 x 2 x 1	0.099	0.20
If there are signs of infection				
a) Vaginal delivery				
Sodium chloride, injectable solution, 0.9% isotonic, 500 ml	25%	1 x 1 x 1	0.812	0.20
IV giving/infusion set, with needle	25%	1 x 1 x 1	0.169	0.04
Cannula, IV, 20 g, sterile, disposable	50%	1 x 1 x 1	0.480	0.24
Ampicillin, injection, 500 mg, vial (2 g IV)	25%	4 x 1 x 1	0.101	0.10
Gentamycin, injection, 40 mg (as sulfate)/ml in 2 ml vial (5 mg/kg body weight IV)	25%	7 x 1 x 1	0.071	0.12
b) C-section				
Sodium chloride, injectable solution, 0.9% isotonic, 500 ml	25%	1 x 2 x 4	0.812	1.62
IV giving/infusion set, with needle	25%	1 x 1 x 1	0.169	0.04
Ampicillin, injection, 500 mg, vial (2 g IV every 6 hours until fever-free for 48 hours)	25%	4 x 4 x 4	0.101	1.61
Gentamycin, injection, 40 mg (as sulfate)/ml in 2 ml vial (5 mg/kg body weight IV every 24 hours)	25%	7 x 1 x 4	0.071	0.50
Metronidazole, injection, 500 mg in 100 ml vial (500 mg IV every 8 hours)	25%	1 x 3 x 4	0.582	1.75
POST-ABORTION CARE				**$8.51**
Manual vacuum aspiration				
Povidone iodine, solution, 10% (antiseptic)	100%	1 x 1 x 1	0.039	0.04
Gloves, surgeon's, latex, size 7-1/2, disposable, sterile, pair	100%	1 x 1 x 1	0.190	0.19
Tetanus toxoid, injection	100%	1 x 1 x 1	0.042	0.04
Syringe, disposable, 2 ml, with needle	100%	1 x 1 x 1	0.027	0.03
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Oxytocin, injection, 10 IU in 1 ml ampoule (to firm myometrium, reduce risk of perforations)	100%	4 x 1 x 1	0.089	0.36
Sodium lactate (Ringer) + set, 500 ml	100%	2 x 1 x 1	0.385	0.77
Intravenous giving/infusion set	100%	1 x 1 x 1	0.220	0.22
Cannula, IV, 20 g, sterile, disposable	100%	1 x 1 x 1	0.480	0.48
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Lidocaine HCL, injection, 2% in 20 ml vial (local anesthesia)	100%	1 x 1 x 1	0.542	0.54
Syringe, disposable, 10 ml, with needle	100%	1 x 1 x 1	0.041	0.04
Alcohol swab	100%	1 x 1 x 1	0.020	0.02

Treatment and commodities	Per cent to treat	No. of units x times/day x days/episode	Unit cost ($)	Average episode cost ($)
Treatment of sepsis				
Ampicillin, injection, 500 mg, vial (2 g IV every 6 hours until fever-free for 48 hours)	25%	4 x 4 x 4	0.101	1.61
Gentamycin, injection, 40 mg (as sulfate)/ml in 2 ml vial (5 mg/kg body weight IV every 24 hours)	25%	7 x 1 x 4	0.071	0.50
Metronidazole, injection, 500 mg in 100 ml vial (500 mg IV every 8 hours)	25%	1 x 3 x 4	0.582	1.75
Sodium chloride, injectable solution, 0.9% isotonic, 500 ml (shock, IV fluid for antibiotics)	25%	1 x 2 x 4	0.812	1.62
IV giving/infusion set, with needle	25%	1 x 1 x 1	0.169	0.04
Lancet, blood, disposable (to take blood sample)	25%	1 x 1 x 1	0.010	0.00
Complete blood count	25%	1 x 1 x 1	0.100	0.03
Catheter, urethral, Foley, Ch 12 (control of urine output)	25%	1 x 1 x 1	0.560	0.14
Bag, urine, 2000 ml (urine collection)	25%	1 x 1 x 1	0.180	0.05
Oxygen, inhalation (medicinal gas) (shock, oxygen 3 hours at 6-8 liters/min)	10%	13.5 x 1 x 1	0.000	0.00
Paracetamol, tablet, 500 mg (pain management)	25%	1 x 4 x 2	0.005	0.01
ASSISTED VAGINAL DELIVERY				**$4.04**
Gloves, surgeon's, latex, size 7-1/2, disposable, sterile, pair	100%	1 x 4 x 1	0.190	0.76
Povidone iodine, solution, 10% (antiseptic)	100%	1 x 1 x 1	0.039	0.04
Clean delivery kit (soap, plastic sheeting, razor blade, umbilical tape, cotton wrap for newborn)	100%	1 x 1 x 1	1.370	1.37
Oxytocin, injection, 10 IU in 1 ml ampoule (to induce uterine contraction, IM)	100%	1 x 1 x 1	0.089	0.09
Syringe, disposable, 5 ml, with needle	100%	1 x 1 x 1	0.033	0.03
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Paracetamol, tablet, 500 mg (pain management after delivery)	100%	1 x 4 x 3	0.005	0.06
Episiotomy or tears				
Lidocaine HCL, injection, 2% in 50 ml vial (local anesthesia)	100%	1 x 1 x 1	0.519	0.52
Syringe, disposable, 10 ml, with needle	100%	1 x 1 x 1	0.041	0.04
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Suture, catgut chromic 3/0, 1 x 150 cm	100%	1 x 1 x 1	0.548	0.55
Needle, suture, assorted sizes, cutting	100%	1 x 1 x 1	0.085	0.09
Gauze pad, 76 x 76 mm, sterile (dressing)	100%	1 x 1 x 1	0.024	0.02
After delivery				
Pethidine, HCl 50 mg/ml, 2 ml (pain management)	50%	1 x 1 x 1	0.403	0.20
Syringe, disposable, 10 ml, without needle	50%	1 x 1 x 1	0.030	0.01
Needle, 21 g, disposable	50%	1 x 1 x 1	0.013	0.01
Alcohol swab	50%	1 x 1 x 1	0.020	0.01
Paracetamol, tablet, 500 mg (pain management)	100%	1 x 4 x 3	0.005	0.06
Other				
Partograph (form to monitor progress of labour)	100%	1 x 1 x 1	0.050	0.05
Delivery record (for clinic)	100%	1 x 1 x 1	0.100	0.10
CAESARIAN SECTION				**$11.09**
Spinal anesthesia				
Sodium lactate (Ringer) + set, 500 ml (to preload and avoid hypotension)	50%	2 x 1 x 1	0.385	0.39
Intravenous giving/infusion set	50%	1 x 1 x 1	0.220	0.11
Cannula, IV, 20 g, sterile, disposable	50%	1 x 1 x 1	0.480	0.24
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	50%	1 x 1 x 1	0.116	0.06
Syringe, disposable, 2 ml, without needle	50%	1 x 1 x 1	0.015	0.01
Needle, spinal, 22 g, sterilizable, with stylet, stainless steel	50%	1 x 1 x 1	0.500	0.25
Alcohol swab	50%	1 x 1 x 1	0.020	0.01
Epinephrine, injection, 1 mg (as hydrochloride) in 1ml ampoule (adrenaline, 0.25 ml, if anest. > 45 min.)	25%	0.5 x 1 x 1	0.069	0.01
and if needed				
Epinephrine, injection, 1 mg (as hydrochloride) in 1ml ampoule (if low blood pressure, 0.2 mg/kg)	10%	1 x 1 x 1	0.069	0.01
Syringe, disposable, 5 ml, without needle	10%	1 x 1 x 1	0.020	0.00
Needle, 21 g, disposable	10%	1 x 1 x 1	0.013	0.00
Alcohol swab	10%	1 x 1 x 1	0.020	0.00

Treatment and commodities	Per cent to treat	No. of units x times/day x days/episode	Unit cost ($)	Average episode cost ($)
General anesthesia				
Ketamine, injection, 50 mg (as hydrochloride)/ml in 10 ml vial	25%	1 x 1 x 1	0.531	0.13
Syringe, disposable, 10 ml, without needle	25%	1 x 1 x 1	0.030	0.01
Needle, 21 g, disposable	25%	1 x 1 x 1	0.013	0.00
Alcohol swab	25%	1 x 1 x 1	0.020	0.01
or				
Halothane, liquid, inhaler, 1 bottle (250 ml)	25%	1 x 1 x 1	18.440	4.61
Sodium lactate (Ringer) + set, 500 ml	25%	2 x 1 x 1	0.385	0.19
Intravenous giving/infusion set	25%	1 x 1 x 1	0.220	0.06
Cannula, IV, 20 g, sterile, disposable	25%	1 x 1 x 1	0.480	0.12
Atropine, injection, 1 mg, (sulfate) in 1 ml ampoule	25%	1 x 1 x 1	0.071	0.02
Syringe, disposable, 5 ml, without needle	25%	1 x 1 x 1	0.020	0.01
Needle, 21 g, disposable	25%	1 x 1 x 1	0.013	0.00
Alcohol swab	25%	1 x 1 x 1	0.020	0.01
Whether spinal or general anesthesia				
Catheter, urethral, Foley, Ch 14	100%	1 x 1 x 1	0.530	0.53
Bag, urine, 2000 ml	100%	1 x 1 x 1	0.180	0.18
Povidone iodine, solution, 10% (antiseptic)	100%	1 x 1 x 1	0.039	0.04
Blade, surgical, no. 22, sterile, disposable	100%	1 x 1 x 1	0.060	0.06
After delivery				
Sodium lactate (Ringer) + set, 500 ml	100%	2 x 1 x 1	0.385	0.77
Intravenous giving/infusion set	100%	1 x 1 x 1	0.220	0.22
Oxytocin, injection, 10 IU in 1 ml ampoule (20 units over 2 hours)	100%	2 x 1 x 1	0.089	0.18
Prophylactic antibiotics				
Ampicillin, injection, 500 mg, vial (2 g IV)	100%	4 x 1 x 1	0.101	0.40
or				
Cefazolin, ampoule, 500 mg (1 g IV)	0%	2 x 1 x 1	0.000	0.00
and				
Suture, catgut chromic 0, 1 x 150 cm (to repair uterine incision)	100%	1 x 1 x 1	0.548	0.55
Suture, catgut chromic 0, 1 x 150 cm (to close fascia)	100%	1 x 1 x 1	0.548	0.55
Suture, synthetic 3/0, non-absorbable, braided polyester, 1 x 150 cm (to close skin)	100%	1 x 1 x 1	0.480	0.48
Needles, suture, assorted sizes, round body	100%	3 x 1 x 1	0.085	0.26
Gauze pad, 76 x 76 mm, sterile	100%	5 x 1 x 1	0.024	0.12
Pethidine, HCl 50 mg/ml, 2 ml (pain management afterwards)	100%	1 x 1 x 1	0.403	0.40
Syringe, disposable, 10 ml, without needle	100%	1 x 1 x 1	0.030	0.03
Needle, 21 g, disposable	100%	1 x 1 x 1	0.013	0.01
Alcohol swab	100%	1 x 1 x 1	0.020	0.02
Paracetamol, tablet, 500 mg (pain management)	100%	1 x 4 x 3	0.005	0.06
URINARY TRACT INFECTION				**$0.30**
Amoxicillin, tablet, 500 mg (anhydrous)	100%	1 x 3 x 3	0.029	0.26
or				
Sulfamethoxazole + trimethropin, tablet 400 mg + 80 mg	0%	2 x 2 x 3	0.007	0.00
Paracetamol, tablet, 500 mg	100%	1 x 4 x 2	0.005	0.04
MASTITIS				**$0.93**
Amoxicillin, tablet, 500 mg (anhydrous)	100%	1 x 3 x 10	0.029	0.88
or				
Erythromycin, tablet or capsule, 250 mg	0%	2 x 4 x 10	0.031	0.00
and				
Paracetamol, tablet, 500 mg	100%	1 x 4 x 3	0.005	0.06
OBSTETRIC FISTULA				**$12.18**
Spinal anesthesia				
Sodium lactate (Ringer) + set, 500 ml (to preload and avoid hypotension)	75%	2 x 1 x 1	0.385	0.58
Intravenous giving/infusion set	75%	1 x 1 x 1	0.220	0.17
Cannula, IV, 20 g, sterile, disposable	75%	1 x 1 x 1	0.480	0.36
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	75%	1 x 1 x 1	0.116	0.09
Syringe, disposable, 2 ml, without needle	75%	1 x 1 x 1	0.015	0.01

Treatment and commodities	Per cent to treat	No. of units x times/day x days/episode	Unit cost ($)	Average episode cost ($)
Needle, spinal, 22 g, sterilizable, with stylet, stainless steel	75%	1 x 1 x 1	0.500	0.38
Alcohol swab	75%	1 x 1 x 1	0.020	0.02
Epinephrine, injection, 1 mg (as hydrochloride) in 1ml ampoule (adrenaline, 0.25 ml, if anest. > 45 min.)	25%	0.5 x 1 x 1	0.069	0.01
and if needed				
Epinephrine, injection, 1 mg (as hydrochloride) in 1ml ampoule (if low blood pressure, 0.2 mg/kg)	10%	1 x 1 x 1	0.069	0.01
Syringe, disposable, 5 ml, without needle	10%	1 x 1 x 1	0.020	0.00
Needle, 21 g, disposable	10%	1 x 1 x 1	0.013	0.00
Alcohol swab	10%	1 x 1 x 1	0.020	0.00
General anesthesia				
Ketamine, injection, 50 mg (as hydrochloride)/ml in 10 ml vial	12.5%	1 x 1 x 1	0.531	0.07
Syringe, disposable, 10 ml, without needle	12.5%	1 x 1 x 1	0.030	0.00
Needle, 21 g, disposable	12.5%	1 x 1 x 1	0.013	0.00
Alcohol swab	12.5%	1 x 1 x 1	0.020	0.00
or				
Halothane, liquid, Inhaler, 1 bottle (250 ml)	12.5%	1 x 1 x 1	18.440	2.31
Sodium lactate (Ringer) + set, 500 ml	12.5%	2 x 1 x 1	0.385	0.10
Intravenous giving/infusion set	12.5%	1 x 1 x 1	0.220	0.03
Cannula, IV, 20 g, sterile, disposable	12.5%	1 x 1 x 1	0.480	0.06
Atropine, injection, 1 mg, (sulfate) in 1 ml ampoule	12.5%	1 x 1 x 1	0.071	0.01
Syringe, disposable, 5 ml, without needle	12.5%	1 x 1 x 1	0.020	0.00
Needle, 21 g, disposable	12.5%	1 x 1 x 1	0.013	0.00
Alcohol swab	12.5%	1 x 1 x 1	0.020	0.00
Whether spinal or general anesthesia				
Catheter, urethral, Foley, Ch 14	100%	1 x 1 x 1	0.530	0.53
Bag, urine, 2000 ml	100%	1 x 1 x 1	0.180	0.18
Prophylactic antibiotics				
Ampicillin, injection, 500 mg, vial (2 g IV)	100%	4 x 1 x 1	0.101	0.40
or				
Cefazolin, ampoule, 500 mg (1 g IV)	0%	2 x 1 x 1	0.000	0.00
and				
Suture, synthetic 2/0, absorbable, braided, violet (vicryl), 2 x 70 cm	100%	1 x 1 x 1	1.715	1.72
Suture, synthetic 2/0, non-absorbable, braided polyester, 1 x 150 cm	100%	1 x 1 x 1	0.480	0.48
Suture, atraumatic, silk 2/0, 45 cm + 3/8 cutting needle, 24.5 mm	100%	1 x 1 x 1	0.683	0.68
Needles, suture, assorted sizes, round body	100%	3 x 1 x 1	0.085	0.26
Gauze pad, 76 x 76 mm, sterile	100%	5 x 1 x 1	0.024	0.12
Post-repair				
Sodium chloride, injectable solution, 0.9% isotonic, 500 ml (rotate with other IV fluids for a total of 3 liters a day)	100%	1 x 1 x 2	0.812	1.62
Sodium lactate (Ringer) + set, 500 ml	100%	1 x 2 x 2	0.385	1.54
IV giving/infusion set, with needle	100%	1 x 1 x 1	0.169	0.17
Pethidine, HCl 50 mg/ml, 2 ml (pain management after repair)	50%	1 x 1 x 1	0.403	0.20
Syringe, disposable, 10 ml, without needle	50%	1 x 1 x 1	0.030	0.01
Needle, 21 g, disposable	50%	1 x 1 x 1	0.013	0.01
Alcohol swab	50%	1 x 1 x 1	0.020	0.01
Paracetamol, tablet, 500 mg (pain management)	100%	1 x 4 x 3	0.005	0.06
CHLAMYDIA TRACHOMATIS				**$0.11**
Doxycycline, capsule or tablet, 100 mg (hydrochloride)	100%	1 x 2 x 7	0.008	0.11
GONORRHEA				**$0.05**
Ciprofloxacin, tablet, 250 mg (as hydrochloride)	100%	2 x 1 x 1	0.023	0.05
SYPHILIS				**$0.49**
Benzathine benzylpenicillin, powder for injection, 1.44 g benzylpenicillin (= 2.4 million IU) in 5 ml vial	95%	1 x 1 x 1	0.238	0.23
Water for injection, 5 ml ampoule	95%	1 x 1 x 1	0.038	0.04
Syringe, disposable, 5 ml, with needle	95%	1.5 x 1 x 1	0.033	0.05
Erythromycin, tablet or capsule, 250 mg (if allergic to penicillin)	5%	2 x 4 x 14	0.031	0.18

Treatment and commodities	Per cent to treat	No. of units x times/day x days/episode	Unit cost ($)	Average episode cost ($)
TRICHOMONAS VAGINALIS				**$0.02**
Metronidazole, tablet, 400 mg (2 g orally, single dose)	100%	5 x 1 x 1	0.004	0.02
PELVIC INFLAMMATORY DISEASE				**$0.47**
Ciprofloxacin, tablet, 250 mg (as hydrochloride)	100%	2 x 1 x 1	0.023	0.05
Doxycycline, capsule or tablet, 100 mg (hydrochloride)	100%	1 x 2 x 14	0.008	0.22
Metronidazole, tablet, 250 mg (500 mg PO)	100%	2 x 2 x 14	0.004	0.20
NEONATAL SEPSIS				**$2.40**
Ampicillin, injection, 500 mg, vial	100%	0.25 x 1 x 14	0.101	0.35
Gentamycin, injection, 40 mg (as sulfate)/ml in 2 ml vial	100%	0.16 x 1 x 14	0.071	0.16
Dextrose in water, 1000 ml + giving set, 5%, bag	100%	0.5 x 0.5 x 2	2.000	1.00
Syringe, disposable, 2 ml, with needle	100%	2 x 1 x 14	0.027	0.77
First aid before referral				
Ampicillin, injection, 500 mg, vial	100%	1 x 1 x 1	0.101	0.10
Syringe, disposable, 2 ml, with needle	100%	1 x 1 x 1	0.027	0.03
OPHTHALMIA NEONATORUM PREVENTION				**$0.03**
Tetracycline , eye ointment, 1% (hydrochloride), tube 5 mg (5 mg/kg once daily)	100%	0.2 x 1 x 1	0.160	0.03
CONGENITAL SYPHILIS				**$1.83**
Penicillin, procaine benzyl, injection, powder, 1 mu (50,000 IU/kg IM 24 hourly for 10 days)	100%	1 x 1 x 10	0.092	0.92
Water for injection, 5 ml ampoule	100%	1 x 1 x 10	0.038	0.38
Syringe, disposable, 5 ml, without needle	100%	1 x 1 x 10	0.020	0.20
Needle, 21 g, disposable	100%	1 x 1 x 10	0.013	0.13
Alcohol swab	100%	1 x 1 x 10	0.020	0.20
PREVENTION OF HIV MOTHER-TO-CHILD TRANSMISSION				**$1.04**
One-dose nevirapine (assumes 60 kg [mother], 3 kg [newborn])				
Nevirapine, tablet, 200 mg (200 mg PO at onset of labour [mother])	100%	1 x 1 x 1	0.600	0.60
Nevirapine, oral solution, 10 mg/ml (2 mg/kg PO [infant])	100%	1 x 1 x 1	0.438	0.44
WHO recommended treatment as of Feb 2004				**$41.96**
a) Mother				
Zidovudine, capsule, 300 mg (1 capsule a day starting in week 28)	100%	1 x 2 x 84	0.214	35.95
Nevirapine, tablet, 200 mg	100%	1 x 1 x 1	0.600	0.60
b) Infant				
Zidovudine, oral solution, 10 mg/ml (2 mg/kg 4x daily for the first week)	100%	1 x 4 x 7	0.178	4.97
Nevirapine, oral solution, 10 mg/ml (2 mg/kg immediately after birth)	100%	1 x 1 x 1	0.438	0.44

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