Benefits of Meeting Women's Contraceptive Needs in Burkina Faso

IN BRIEF

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Key Points

- Each year, nearly one-third of pregnancies in Burkina Faso are unintended. The vast majority of unintended pregnancies in the country are mistimed (occurred too soon) rather than unwanted (occurred after the woman had reached her desired family size) — 87% vs. 13%.
- Of all women who currently want to avoid pregnancy, almost two-thirds are either not using any contraceptive method or are using a relatively ineffective traditional one. Together, these women are considered to have an unmet need for modern contraception.
- This measure is greatest among the poorest women: Nearly 90% of women wishing to avoid pregnancy in the lowest wealth quintile have an unmet need for a modern contraception, compared with 36% of those in the highest wealth category.
- Meeting half of need for modern methods at the national level would result in 116,000 fewer unintended pregnancies each year, leading to 37,000 fewer unsafe abortions and 400 fewer maternal deaths.
- Investing in modern contraceptive services to fulfill half of unmet need would save the country US$18 million (8.6 billion African Financial Community francs) per year that it would no longer have to spend on medical costs associated with unintended pregnancies and their consequences.
- Expanding contraceptive services confers substantial benefits to women, their families and society. All stakeholders, including the Burkinabe government and the private sector, should increase their investment in modern contraceptive services.

Many women and couples in Burkina Faso do not have the knowledge, means or support they need to protect their reproductive health and to have the number of children they desire. Consequently, many women have more children than they want or can care for. Others turn to induced abortion, which is overwhelmingly clandestine and potentially unsafe.

By helping women and couples plan their families and have healthy babies, good reproductive health care—including sufficient access to contraceptive services—contributes directly to attaining three Millennium Development Goals (MDGs): reducing child mortality, improving maternal health, and combating HIV/AIDS. Improving contraceptive services may also make meeting other MDGs—such as achieving universal primary education, reducing endemic poverty and promoting women's empowerment and equality[1]—easier and more affordable.

This *In Brief* aims to chart a course toward better health for Burkinabe women and their families by highlighting the health benefits and cost savings that would result from improved contraceptive services. Building on prior work[2–5] and using national data to provide estimates for 2009 (see box), it describes current patterns of contraceptive use and two hypothetical scenarios of increased use to quantify the net benefits to women and society that would result from helping women avoid pregnancies they do not want. We focus on the disability and deaths that would be averted and the financial resources that would be saved through preventing unintended pregnancy. Unless otherwise specified, all data presented are special calculations based on the sources listed in the methods box, using the methodology detailed in the Appendix at the end of report.

Pregnancy and childbirth entail health risks for both women and newborns.
Although an international program that heavily subsidizes professional deliveries has, since 2007, helped increased the proportion of Burkinabe women giving birth in a

facility,[6] nearly 30% of women giving birth in 2009 had no medical personnel in attendance.[7] Moreover, only 20% of pregnant women made the recommended four prenatal care visits that year. Without these important components of prenatal and delivery care, both mother and child may be at elevated risk for complications.[8]

That risk is apparent in the country's elevated infant mortality rate: For every 1,000 live births, an estimated 80 infants die before their first birthday, with 35 of these deaths (44%) occurring in the first month of life.[9] One measure that quantifies the potential burden of early mortality and poor health is the number of healthy years that would be lost as a result. These are known as disability-adjusted life years, or DALYs. From our analysis of 2009 data, complications suffered in the first month of life and the associated long-term consequences resulted in a projected loss of about 645,000 healthy years of life among Burkinabe newborns.

Maternal mortality is also high in Burkina Faso. The World Health Organization (WHO) estimated in 2008 that 560 Burkinabe women die annually from pregnancy- and delivery-related causes for every 100,000 live births.[10] According to our analysis, a total of 3,600 women died from maternal causes in 2009; about 820 of them—23% overall— had not intended to be pregnant. These deaths, together with an unknown amount of related disability, result in Burkinabe women losing an estimated 236,000 healthy years of life to problems related to pregnancy and childbirth each year; one-third (74,000) of these DALYs were associated with unintended pregnancies in 2009.

Since preventing unintended pregnancy is one of the most direct ways to lower maternal mortality,[11] expanding effective contraceptive use is crucial to women's health. Much maternal morbidity and mortality can be traced to unsafe, clandestine abortion, an outcome that would be greatly reduced if unintended pregnancies could be avoided

in the first place. Induced abortion is subject to severe legal restrictions in Burkina Faso. It is legal only when continuing the pregnancy would endanger the woman's health and life, when the fetus has a serious abnormality and in cases of rape or incest.[12] According to a recent study to assess the overall incidence of abortion (very few of which are legal), an estimated 87,000 Burkinabe women resorted to an induced abortion in 2009.[13] Conditions of clandestine abortions are so unsafe that 43% are thought to lead to complications that require facility-based care.

Contraceptive use can directly improve the health of women and their newborns. The use of modern contraceptives not only leads to fewer abortions but enhances maternal and infant health by helping women avoid high-risk births. The level of contraceptive use and unmet need for it are typically calculated among all married women, including those who want to become pregnant. In our study, we calculate these indicators among only those women who want to *avoid* a pregnancy. Also, we estimate use and need among both married women, who are assumed to be sexually active, and sexually active unmarried women (i.e., those who report having had sex in the past three months.) Further, because traditional methods typically have much higher failure rates than modern methods do,[14] our measure of unmet need is for modern methods, and it therefore considers both users of traditional methods and those not using any method to be in need. These women have the most to gain from improved modern contraceptive services and thus are most relevant to planning reproductive health policies and programs.

In 2009, 1.4 million women aged 15–49—or roughly 39% of all Burkinabe women of reproductive age—were sexually active, were able to become pregnant and either wanted to delay having a child for at least two years or wanted no more children (Table

1). These women form the basis for our analysis. Although the vast majority were married, 13% (175,000 women), were unmarried and sexually active.

Of Burkinabe women wanting to avoid pregnancy in 2009, 71% wished to wait at least two years before having their next child, and 29% wanted to stop childbearing altogether. Yet, despite wanting to avoid pregnancy, only about 36% of these women used an effective, modern method of contraception. A total of 64% had an unmet need for modern contraception: 4% who used a traditional method (mostly withdrawal and rhythm), plus the 60% who used no method at all.

Unmet need varies widely by region and wealth status. For instance, in 2009, it was much lower than the national average of 64% in the region of Centre (37%), which contains Ouagadougou, the capital, where modern contraceptive services are likely to be more available and accessible than in other parts of the country. By contrast, unmet need was highest in Sahel, at 85%. The poorer the woman wanting to avoid pregnancy, the higher her level of unmet need for a modern method: Unmet need ranged from 36% among women in the highest wealth quintile to 88% among those in the lowest in 2009.

Current contraceptive use in Burkina Faso is inadequate.
Burkinabe women use a limited range of modern contraceptive methods to achieve their childbearing goals. As of 2009, 36% of women who wanted to avoid pregnancy were using a modern method; this figure includes the 19% of women who were using the injectable or the implant, 9% the male condom, 7% the pill, and about 2% the IUD, other supply methods and female sterilization.

The country's two most recent Enquêtes Démographiques et de Santé au Burkina Faso (EDSBF III and IV) showed that modern contraceptive use among all married women

(including those wanting to become pregnant) rose by 74% between 2003 and 2010.[9,15] However, the starting point was so low (9%) that current modern use is still quite limited (15%). Several reasons likely explain the country's low level of use. In Burkina Faso, where 84% of reproductive-age women are illiterate,[15] low levels of knowledge about contraception are compounded by misinformation about how methods work and what side effects they may have. Modern methods are also likely to be inaccessible to many Burkinabe women who live far from the country's few urban centers or who cannot afford them (77% of the population is rural,[16] and 46% lives in poverty[17]). Indeed, in one study with data from 39 countries, Burkina Faso had the highest proportions of women citing cost and access barriers as reasons for not practicing contraception in 2003.[18]

One-third of pregnancies are currently unintended.

Family size is declining very slowly in Burkina Faso, where the population is increasing by 3% each year.[17] Burkinabe women now have an average of six children, just one fewer than they did almost two decades ago. Moreover, this number of children is very close to the number they consider to be ideal.[15] As a result, a relatively low proportion of births are unplanned: fewer than one-fourth, a figure that has not changed much since 1993.[19] The vast majority of unplanned births (87%) came too soon, while 13% occurred after a women had already achieved her desired family size.[15]

When we look at pregnancies, rather than births, roughly one-third (31%) of the 870,000 pregnancies in 2009 were unintended (Table 2): 15% of all pregnancies resulted in births that came too soon; 2% in births that occurred after a woman said she wanted no more children; 10% in induced abortion. Four percent of pregnancies were unintended and ended in miscarriage (see Appendix for how we calculate the proportion of pregnancies, both intended and unintended, that end in miscarriage).

As mentioned earlier, modern methods are more effective at preventing unintended pregnancies than are traditional methods. In Burkina Faso, as of 2009, fewer than 4% of the women who wanted to avoid pregnancy and were using a modern method became pregnant in a year, compared with 15% of similar women who used a traditional method. Of course, using no method at all carries the highest risk of unintended pregnancy: Of those wanting to avoid a pregnancy but not practicing contraception, 29% became pregnant.

Contraceptive use promotes health and saves lives.

Given that unsafe abortion and other maternity-related risks can be reduced drastically by preventing unintended pregnancy, what is the quantifiable contribution of increasing modern family planning use to women's—and the nation's—health and well-being? As the following hypothetical scenarios show, higher levels of effective contraceptive use directly correspond to lower levels of unintended pregnancy and its negative outcomes.

Compared with no modern contraceptive use at all, current reliance on modern and traditional methods has clearly had a positive impact: According to our estimates for 2009, Burkinabe women are currently experiencing roughly 271,000 unintended pregnancies each year, of which 184,000 end as unplanned births and miscarriages, and 87,000 are resolved by abortion (Table 3 and Figure 1). However, if Burkinabe women were to not use any modern contraceptives and maintain traditional use at its current level, the country would have to contend with some 412,000 unintended pregnancies. Assuming that the country's patterns of pregnancy outcomes would stay the same, about 274,000 pregnancies would end in unplanned births and miscarriages, and 138,000 in unsafe abortions. Thus, the current level of family planning use already

averts around 141,000 unintended pregnancies each year and, as a result, some 51,000 induced abortions.

Each year, the pregnancies and abortions that are averted, in turn, prevent 400 maternal deaths and the loss of 38,000 healthy years of women's lives. Overall, the current level of use reduces these negative maternal outcomes by 10–14%, compared with what would occur in the absence of any modern use.

Raising current levels of modern method use would increase benefits further. Ideally, all women who want to avoid pregnancy would use a modern contraceptive method. In that hypothetical situation, there would be 232,000 fewer unintended pregnancies than currently occur each year. This would reduce unplanned births, clandestine abortions and miscarriages associated with unintended pregnancies by 85–87%. Because maternal deaths would then drop by about 700 per year—and some unquantifiable amount of disability would also be averted—some 63,000 healthy years of women's lives would be saved annually. Moreover, full use of modern methods among women wanting to avoid pregnancy would result in about 10,000 fewer infant deaths each year than would have occurred had these unintended pregnancies been carried to term.

Though it is a worthy goal to reach a point where all women who want to avoid pregnancy are using a modern method, it may be difficult in Burkina, particularly in the short term. Not only must current services be increased, but expanding access will require far broader improvements in infrastructure. A more realistic scenario would be meeting half of current unmet need for modern contraception, so that 68% of women who want to avoid pregnancy use a modern method (see Appendix for explanation of how the proportions of women in each category of contraceptive use would change). Even in this more modest scenario, the benefits over the current situation are notable:

There would be nearly 116,000 fewer unintended pregnancies each year, which would mean 63,000 fewer unplanned births, 37,000 fewer induced abortions and 350 fewer maternal deaths than currently occur each year.

Modern contraception also saves money.

Every dollar spent on family planning saves money that would otherwise be spent on maternal, newborn and postabortion care associated with unintended pregnancies. To calculate the net savings, we first need to estimate costs. Applying our model of per-user cost to the estimate of current modern method users yields a total (direct and indirect) current cost for family planning services of $US 21million (9.8 billion francs*[A] de la Communauté Financière Africaine, or FCFA; Figure 2; see Appendix for an explanation of how these per capita costs were calculated). These costs would rise to $40 million (FCFA 18.9 billion) to meet half of the need for modern methods among women wanting to avoid pregnancy, and to $59 million (FCFA 27.9 billion) to meet all of that need. (Total costs are borne by all sectors of society—national and local government, private and public international donors, nongovernmental organizations, Burkinabes paying out-of-pocket, etc.)

Under each scenario of increasing modern contraceptive use, more unintended pregnancies are prevented, which in turn lowers the cost of providing maternal and newborn care. The total cost of medical care associated with unintended pregnancies would fall by $37 million (FCFA 17.7 billion) from current spending levels if half of unmet need for modern contraceptives were fulfilled, and it would drop by $70 million (FCFA 33 billion) if all women who wanted to avoid a pregnancy were able to do so

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[A] *Exchange rate for 2009 calculated as US$1=FCFA 472.1863 (source: World Bank, Indicators: official exchange rate (LCU per US$, period average), 2011, <http://data.worldbank.org/indicator/PA.NUS.FCRF>, DOWNLOAD data, PA.NUS.FCRF_Indicator_MetaData_en_EXCEL.xls, row 59, column AZ; accessed Oct. 6, 2011).

with a modern method. Moreover, these are only short-term direct health savings from spending on unintended pregnancy (i.e., pregnancy-related care, including obstetric emergencies, postabortion services, antenatal, delivery and newborn health care); longer-term savings would accrue in many areas, such as costs for education, water and sanitation services, and immunization programs—to name just a few.[1]

The proposed increases in family planning costs, which may seem high at first glance, are more than compensated for by the savings that accrue from the reduced maternal and newborn health care costs that are associated with lower incidence of unintended pregnancy and unplanned births. Thus, considering only the costs of family planning and maternal and newborn health care, current contraceptive use results in a net annual savings of $24 million (FCFA 11.5 billion) over what would have been spent on care associated with pregnancy, childbearing and routine newborn care in the absence of any modern method use.

Although reducing unmet need for modern methods would involve increasing funding for contraception, net savings would still result. Compared with the combined costs of current contraceptive, maternal, newborn and postabortion care, meeting half of the need for modern contraceptives would result in a net savings of $18 million (FCFA 8.6 billion). Fulfilling all unmet need would generate an even greater net savings, of $32 million (FCFA 15 billion).

Additional funding is needed now—but will pay off later.
Current funding for contraception is inadequate. Family planning services represent only a fraction of the total outlay for the broad-ranging category of reproductive health. According to the country's National Health Accounts (Comptes Nationaux de la Santé de la Reproduction), data for 2005–2006 show that the per capita outlay for *all*

reproductive health costs (encompassing 17 individual areas) was a mere $1.68 (FCFA 881) per person.[20]

Pregnancy-related health problems, including complications from clandestine abortions, can result in women being unable to work and unable to look after their families for substantial periods of time. Increased modern method use would not only increase individual women's well-being, productivity and ability to care for their families, but would also enable the country to attain the MDGs more quickly and more affordably than would otherwise be possible. For example, meeting all unmet need for modern contraception would bring the nation closer to reaching the all-important goal of broadly reducing maternal mortality by 2015. Simply lowering fertility—and hence women's exposure to the risks inherent in pregnancy and childbearing—through increased modern use reduces the numbers of maternal deaths. There could be almost 20% fewer maternal deaths each year (and 85% fewer unintended pregnancies) if all women who want to avoid pregnancy could reap the full benefits of modern contraception.

Investing in contraceptive services not only promotes health among women and families, it also saves money. Spending now so that half of the women wishing to avoid pregnancy who use no method or a traditional one could adopt a modern method could save the country about $18 million (FCFA 8.6 billion) annually, compared with what it would otherwise spend on care related to unintended pregnancies and their consequences. Responsibility for this investment will have to be shared by a wide variety of stakeholders, including national and regional governments, the private sector and international donors. Higher levels of contraceptive use would strengthen the labor force by improving the health of working women of childbearing age and the well-being of future generations. Moreover, the monetary savings from averting unintended

pregnancy and its negative outcomes could be redirected toward economic development and a variety of public services. Taking on these costs now would avoid much greater expenses down the road. The benefits to Burkinabe women and their families—in improved quality of life and lives saved—would be immeasurable.

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METHODS BOX

The 2009 estimates in this report are projected from the most recent available data. Unless otherwise noted, the data were calculated using the following methods. An Appendix, containing sources and more methodological details, is available at the end of the publication.

The numbers of women in each region, by marital status, desire to avoid pregnancy and contraceptive use in 2009, were estimated using the 2003 Burkina Faso Demographic and Health Survey (DHS), preliminary findings from the 2010 DHS, and regional estimates of the number of women aged 15–49 from the National Institute for Statistics and Demography.

The numbers of unintended pregnancies in 2009 under current contraceptive-use patterns and alternative scenarios were based on contraceptive use–failure rates and pregnancy rates for nonusers from the two DHS sources and other sources, adjusted to the estimated number of unintended pregnancies in 2009.

Intention status of pregnancies and their outcomes for 2009 was estimated from data on the planning status of recent births from the 2003 DHS, estimates of induced abortion rates in 2008 from the Guttmacher Institute (which we assume also applied in 2009) and estimates of the number of miscarriages.

Pregnancy-related deaths were estimated using national-level maternal mortality estimates provided by the World Health Organization (WHO) for 2008. National estimates of unsafe abortions for 2009 were provided by the Guttmacher Institute. Regional infant death rates were estimated from the two DHS sources.

National-level estimates for 2009 of disability-adjusted life years (DALYs) related to pregnancy and of DALYs among newborns were obtained from the 2004 revision of DALYs estimated by the WHO Global Burden of Disease project. This formed the basis for rates used to estimate pregnancy-related and newborn DALYs in 2009.

Costs of contraceptive services and maternal and newborn health care were estimated from basic cost elements. For each contraceptive method or health care intervention, we combined the costs of drugs, supplies and materials; labor and hospitalization; and programs and systems to arrive at a per-user cost for each year of protection against unintended pregnancy or per woman receiving pregnancy-related medical care (in 2009 U.S. dollars). Program and system costs, which refer to indirect costs such as overhead and capital expenditure, are from the United Nations Economic and Social Council.

Direct costs of drugs, supplies, materials and labor used for family planning and mother and newborn health care interventions were taken from the United Nations Population Fund's Reproductive Health Costing Tool and from cost data from official sources in Burkina Faso.

Acknowledgments

Table 1. Unmet Need for Modern Contraception. Unmet need for modern contraception among Burkinabe women aged 15-49 who want to avoid pregnancy, by region and wealth status, 2009

Region and wealth quintile	No. of women aged 15–49 (000s)	Women who want to avoid pregnancy*			
		No. (000s)	% using no method	% using a traditional method†	% with unmet need for modern method‡
Total	3,560	1,400	60.2	3.7	63.9
Region					
Boucle du Mouhoun	340	140	55.6	1.6	57.2
Cascades	140	50	43.7	1.8	45.5
Centre	510	230	33.4	3.8	37.2
Centre-est	290	100	72.2	1.4	73.6
Centre-nord	300	110	62.7	6.2	68.9
Centre-ouest	300	120	67.8	3.4	71.3
Centre-sud	160	50	70.6	1.5	72.1
Est	290	80	70.1	13.3	83.4
Haut-bassins	390	180	59.7	1.9	61.6
Nord	290	140	73.2	3.0	76.1
Plateau Central	170	60	78.8	1.0	79.8
Sahel	230	90	84.7	0.5	85.2
Sud-ouest	150	50	44.1	14.9	59.0
Wealth quintile					
First (poorest)	620	190	83.3	4.7	88.0
Second	650	220	75.6	5.4	81.0
Third	850	300	71.4	3.5	74.9
Fourth	590	230	65.8	2.5	68.3
Fifth (wealthiest)	850	460	33.0	3.3	36.2

Note: The Demographic and Health Surveys rank households according to their household assets and then divide the households into five groups of equal size (quintiles). We merged individual respondent data with household data to assign respondents to their respective quintile. *Women who are married or are unmarried and have been sexually active within the past three months; are able to become pregnant; and do not want any more children or do not want a child in the next two years. †Rhythm, withdrawal and folk methods. ‡Includes nonusers and users of traditional methods. By modern methods, we mean the pill, IUD, injectable, implant, male condom, and male and female sterilization.

Source: See Appendix at end of publication.

Table 2. Pregnancies and Their Outcomes. Pregnancy intendedness and outcomes of unintended pregancies, according to wealth quintile, 2009

Wealth quintile	Pregnancies, by intendedness				Outcomes of unintended pregnancies (as a proportion of all pregnancies)*		
	No. (000s)	% intended	% unintended	Total	% ending in mistimed births†	% ending in unwanted births‡	% ending in induced abortions
Total	870	69	31	100	14.7	2.2	10.1
First (poorest)	170	70	30	100	15.1	1.6	9.2
Second	180	71	29	100	13.7	2.5	8.8
Third	230	69	31	100	15.6	1.6	9.2
Fourth	160	68	32	100	15.2	2.7	9.1
Fifth (wealthiest)	130	64	36	100	13.3	2.8	15.5

No te: See Table 1 for explanation of wealth quintiles. *Because this table does not include miscarriages, the three columns representing pregnancy outcomes do not sum to the total proportion of pregnancies that are unintended (31%). †A birth is considered mistimed if the woman did not intend to have a child in the next two years when she became pregnant. ‡A birth is considered unwanted if the woman wanted no more children when she became pregnant.

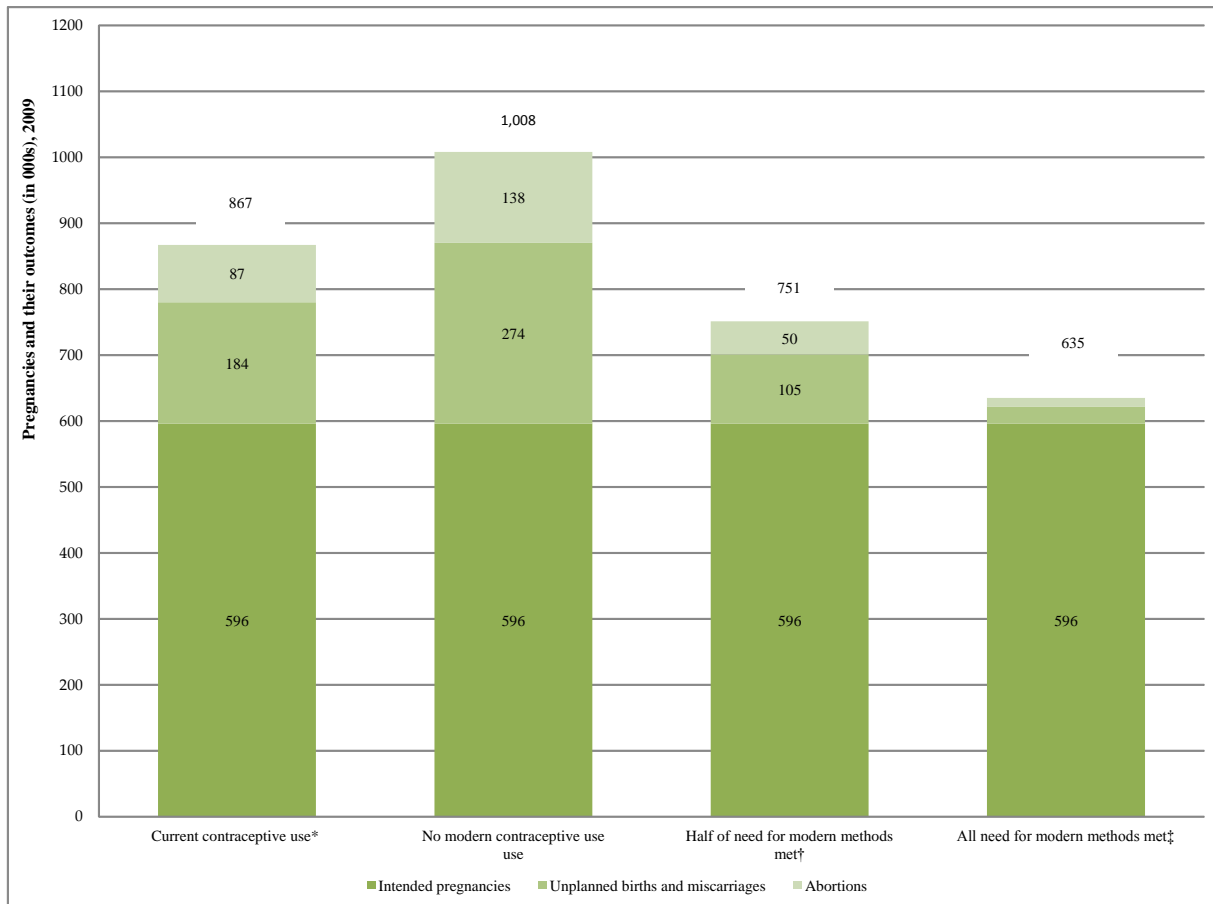*Source:* See Appendix for details.

Table 3. Scenarios of Varying Levels of Modern Contraceptive Use. Impact of modern contraceptive use in reducing unintended pregnancies and their negative consequences, by variety of outcomes, 2009

Outcome	No. of unintended pregnancies and related outcomes, by scenario				Percentage reduction in outcomes, by scenario		
	Current contraceptive use*	No modern contraceptive use	Half of need for modern methods met†	All need for modern methods met‡	Current use vs. no modern use	Half of unmet need met vs. current use	All unmet need met vs. current use
Unintended pregnancies	271,000	412,000	155,000	40,000	34	43	85
Unplanned births	146,000	217,000	83,000	21,000	33	43	86
Induced abortions	87,000	138,000	50,000	13,000	37	43	85
Miscarriages	38,000	57,000	22,000	5,000	33	42	87
Maternal deaths	3,600	4,000	3,200	2,900	10	11	19
Infant deaths	49,800	55,200	44,900	39,900	10	10	20
Maternal DALYs	236,000	275,000	211,000	173,000	14	11	27
Newborn DALYs§	645,000	749,000	536,000	473,000	14	17	27

Notes: DALY=disability-adjusted life year, a measure that quantifies healthy years of life lost because of death or disability. The sums and differences calculated from these data do not always match the figures presented in the text because of rounding. *Method mix among women wanting to avoid pregnancy: 36% modern, 4% traditional, 60% none. †Method mix among women wanting to avoid pregnancy: 68% modern, 2% traditional, 30% none. ‡100% modern method use among women wanting to avoid pregnancy. §Perinatal.
Source: See Appendix.

Figure 1. Benefits of Reducing Unmet Need.
Increasing use of modern contraceptive methods leads to fewer abortions and fewer unplanned births.
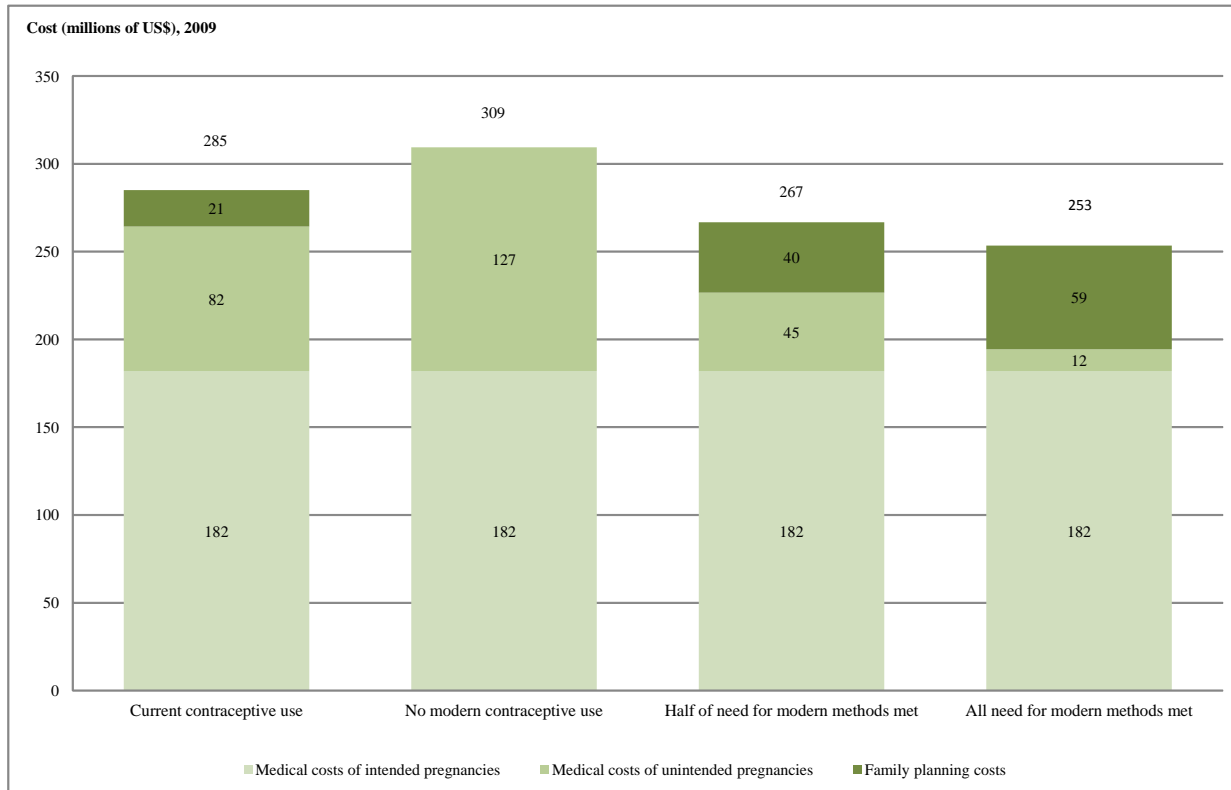

*Method mix among women wanting to avoid a pregnancy: 36% modern, 4% traditional, 60% none.
†Method mix among women wanting to avoid a pregnancy: 68% modern, 2% traditional, 30% none.
‡100% modern method use among women wanting to avoid a pregnancy.

Figure 2. Cost Savings.
 Investing in contraception could greatly reduce costs associated with unintended pregnancy.

Cost (millions of US$), 2009

Legend: Medical costs of intended pregnancies ■ Medical costs of unintended pregnancies ■ Family planning costs

Notes: Cost components may not sum to totals because of rounding. Medical costs include costs for prenatal care, routine newborn care, professional delivery care, obstetric emergency care and, for unintended pregnancies only, treatment of complications from unsafe
Source: See Appendix.

Benefits of Meeting Women's Contraceptive Needs in Burkina Faso

Methodology Appendix

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Methodology Appendix

The estimates of the costs and benefits of contraception in Burkina Faso cover many variables derived from multiple sources. They draw from the most recent available data, projected to 2009.

1. Numbers of women in each region aged 15–49, by marital status

a. Total population of Burkina Faso, 2009[i]
Population numbers from the 2006 census were extrapolated to 2009 using projected growth rates by region estimated by the country's National Institute of Statistics and Demography (Institut National de la Statistique et de la Démographie, INSD).

b. Population for each region, 2009
All 13 health regions of Burkina Faso were included in the analysis, with their population projected to 2009 as described above.[B]

c. Women aged 15–49 by region, 2009[i]
The numbers of women of reproductive age also come from the report on projections based on the census.

d. Women aged 15–49 in each region, by marital and household wealth status, 2009[ii]
We applied the 2003 Demographic and Health Survey (DHS) distribution of women aged 15–49 in each region by marital status and by household wealth quintile to the estimated numbers of women aged 15–49 in each region in 2009. When possible, these regional calculations were then summed to national totals.

In the DHS, women are categorized according to the wealth of their household, relative to other households in the country. Wealth quintiles divide the total household population into fifths.[iii] However, women aged 15–49 make up smaller

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[B]In this and subsequent calculations, when regional data or estimates were available, the national number was computed as the sum of regional numbers.

proportions of the household population in poorer wealth quintiles and larger proportions in rich households. Thus, the proportion of women in each quintile varies from 20% (Table 1).

Table 1. Distribution of women aged 15–49 by wealth status

Wealth status (quintile)	Proportion of women aged 15–49
First (poorest)	18
Second	18
Third	24
Fourth	16
Fifth (wealthiest)	24

Source: reference 2.

2. Risk for unintended pregnancy and contraceptive use status

a. Current (2009) risk for unintended pregnancy and method use[ii]

Percentage distributions of women aged 15–49, by risk for unintended pregnancy and contraceptive use, were tabulated according to marital status, by region and household wealth quintile from the 2003 DHS.

Women aged 15–49 in each regional, marital-status and wealth-quintile subgroup were classified as

    1) **not at risk for unintended pregnancy** (not sexually active, infecund or wanting a child within the next two years);

    2) **at risk** for unintended pregnancy (fecund and either married or unmarried and sexually active) and seeking to **space** future births; or

    3) **at risk** for unintended pregnancy and seeking to **limit** future births (married or unmarried and sexually active, fecund and not wanting another child).

In addition, a relatively high and stable proportion of Burkinabe women are pregnant or amenorrheic at any given time. The fertility preferences of these temporarily infecund women are important for assessing the general need for modern contraception. We thus consider women to be at risk for unintended pregnancy if their current pregnancy or most recent birth was mistimed (i.e., women seeking to space births) or unwanted (i.e., women seeking to limit births).

Definitions of components of risk for unintended pregnancy:

1) *Sexual activity.* All currently married women were assumed to be sexually active. Women who were not married were classified as sexually active if they reported having had intercourse in the prior three months. Because of stigma attached to nonmarital sex, the level of sexual activity—and therefore risk for unintended pregnancy—is likely to be underestimated among unmarried women.

2) *Fecundity.* Sexually active women were classified as infecund if they reported being so at the time of the survey, had had a hysterectomy, or were menopausal. We also considered to be infecund those women who were neither pregnant nor in postpartum amenorrhea but who had not had a menstrual period for six or more months, as well as those who were married and not using a contraceptive method during the past five years, but had not had a birth and were not currently pregnant.

3) *Childbearing intentions.* Intention for future childbearing was defined according to women's desire for a child (or another child). Among pregnant women, intention was based on whether their current pregnancy was wanted at that time or earlier, mistimed or unwanted.

4) *Amenorrhea.* Women who were amenorrheic were classified according to the intention status of their last birth.

Women at risk were further classified according to contraceptive use status, as follows:

1) Modern method users (tubal ligation, vasectomy, IUD, injectable, implant, pill, condom and other supply methods)

2) Traditional method users (periodic abstinence, withdrawal and other non-supply methods)

3) At risk but using no contraceptive method

b. Alternative contraceptive-use scenarios

We examined four alternative contraceptive-use scenarios for women at risk for unintended pregnancy. All of these scenarios assume that other variables are unchanged, including the number of women aged 15–49 and their distribution by region, marital status, household wealth, fecundity, intention to space or limit births, and sexual activity (among unmarried women). The scenarios are as follows:

1) *Zero modern contraceptive use.* This scenario assumes that none of the women at risk for unintended pregnancy use a modern method of contraception. In other words, all current modern method users become nonusers, and the only users of contraception are the current traditional method users. All such women (the nonusers and the traditional method users) are assumed to have an unmet need for modern methods of family planning.

2) *Current contraceptive situation.* This scenario represents actual levels of contraceptive use in Burkina Faso as obtained from the 2003 and 2010 DHS surveys.

3) *All unmet need for modern methods met.* In this scenario, all women at risk for unintended pregnancies—including current nonusers and those who currently use traditional methods—become users of modern methods. The proportions of women using each type of modern method are based on the mix of modern methods used currently. Unmet need for modern contraception is reduced to zero in this scenario.

4) *Half of unmet need for modern methods met.* In this scenario, 50% of at-risk women who are currently nonusers become users of modern methods, and 50% of current users of traditional methods become users of modern methods. Although the overall method mix changes from the current-use scenario, the method mix among users of modern methods and among users of traditional methods remains unchanged.

3. Current numbers of births, intention status of births and pregnancy outcomes

a. Total pregnancies
This is the sum of conceptions ending in birth, induced abortion and miscarriage.

b. Numbers of births, by region, 2009[ii]
We applied regional general fertility rates from the 2003 DHS to the 2009 numbers of women aged 15–44 in each region to estimate the number of births, by region, in 2009. The general fertility rate is the number of births in each region in the three years preceding the 2003 DHS per 1,000 women aged 15–44.

c. Planning status of births[ii]
We distributed the estimated numbers of births in each region in 2009 according to the planning-status distribution of births reported in the 2003 DHS.

The fertility planning status variable categorizes births according to whether women reported wanting a pregnancy then, wanting a pregnancy later, or not wanting any (additional) births. Births among women who had wanted the pregnancy later are called "mistimed." Births that resulted from pregnancies that were not wanted at all are called "unwanted." All other births are called "intended."

d. Number of induced abortions, 2009[iv]

We estimated the national number and rate of induced abortions for 2009. The rate of abortions was assumed to be constant for all categories of household wealth status.

e. Number of miscarriages[v]
Miscarriages are estimated to be equivalent to 20% of pregnancies ending in birth plus 10% of those ending in induced abortion. These proportions attempt to account for pregnancies that end in miscarriage late enough to be noted by the woman (6–7 weeks after the last menstrual period).

f. Intended pregnancies
Intended pregnancies are the sum of intended births and estimated miscarriages of intended conceptions.

g. Unintended pregnancies
Unintended pregnancies are the sum of unplanned births, induced abortions and estimated miscarriages following unintended conceptions.

4. Unintended pregnancies among women at risk

Annual pregnancy rates among women using contraceptive methods and among women at risk for unintended pregnancy who were using no method were multiplied by the estimated numbers of women in Burkina in 2009 (according to current contraceptive use patterns) to estimate the current number of unintended pregnancies. This is an alternative method of estimating unintended pregnancies using contraceptive method failure rates. The reason for making this alternative estimate is to develop adjusted failure rates (see below) which are needed to estimate unintended pregnancies in the scenarios in which all or half of current unmet need for modern methods is met.

a. **Initial pregnancy rates**
Table 2 shows the initial failure rates used in the study.

Table 2. Contraceptive failure rates.

Contraceptive method	Failure rate
Female sterilization	0.50
Male sterilization	0.15
Pill	6.50

IUD	1.70
Injectable/implant	2.40
Condom	10.30
Other supply	15.00
Periodic abstinence	24.30
Withdrawal	20.90
Other nonsupply	22.60
No protection	40.00

Sources: references [vi] and 8.

For women at risk for unintended pregnancy using no method, we assumed an annual pregnancy rate of 40%.[vii,viii] The 40% estimate is much lower than the 85% annual pregnancy rate that Trussell et al. estimate for couples who are continually sexually active.[ix] Some studies have suggested, however, that couples at risk for unintended pregnancy who are using no contraceptive method are not continually sexually active.[x,xi]

b. Failure rate adjustment

The number of pregnancies, based on current contraceptive use among women at risk for unintended pregnancy and the initial failure rates for each method, differed in all regions from the number of unintended pregnancies estimated by use of the DHS intention status variable (discussed in section 3 above). This is likely due, in part, to the fact that many unintended pregnancies that end in induced abortion are not reported in the DHS or other surveys of women. Therefore, the initial failure rates for each method were adjusted so that the number of unintended pregnancies calculated in each region equaled the number estimated from intention status.

The same regional adjustment was applied to the initial use–failure rates for all methods and the nonuse pregnancy rate used for all women in the same region, regardless of women's marital status or household wealth.

c. Outcomes of unintended pregnancies

Unintended pregnancies were distributed according to outcome (birth, induced abortion or miscarriage), based on the regional distributions estimated from the 2003 DHS birth rates and intention status information, 2008 induced abortion rates and model-based miscarriage rates.

5. Mortality and morbidity

a. Pregnancy-related deaths[xii]

The World Health Organization (WHO) estimate of the national maternal mortality ratio (MMR) was used for all regions and all wealth quintiles. Ministry of Health (MOH) statistics on maternal deaths were examined but judged to be unusable because only deaths recorded at health facilities were included. The assumption that maternal mortality is equal among women in all regions and wealth groups is likely inaccurate (in that wealthy and urban women most likely have lower mortality than their poor and rural counterparts), but unavoidable.

b. Infant and neonatal deaths

We applied interpolated regional infant and neonatal mortality rates from the 2003 DHS and the preliminary results of the 2010 DHS to the regional numbers of births in 2009.

c. Disability-adjusted life years (DALYs) incurred by pregnant women and perinatal infants, 2009

We combined WHO estimates of 2004 DALYs for Burkina Faso with regional (Sub-Saharan Africa) projected estimates for 2008.[xiii,xiv] Both sources were used because, as well as being more recent, the regional estimates have condition-specific DALYs, while the country-specific ones do not.

d. Regional and wealth quintile rates of DALYs, 2009

We assumed that rates of maternal and perinatal DALYs for Burkina Faso as a whole applied across all regions of the country and wealth quintiles. Again, this is a weak assumption because rates of DALYs most likely vary by rural-urban residence and by income group, but it is unavoidable.

6. Costs of providing contraceptive and pregnancy-related care

a. Cost per user (per year) adjustments—contraceptive services

1) We obtained cost per user per year from Singh et al.,[xv] who used the results from UNFPA[xvi] and its Reproductive Health Costing Tool (RHCT).[xvii]

2) Raw data from the RHCT were adjusted as follows: (a) the cost for the DHS "injection/implant" category is a weighted average of cost of injectables (51.5%) and implants (48.5%), using MOH data on method mix in Burkina Faso (injectables were assumed to provide three months of protection and implants three years of protection); and (b) the sterilization costs are multiplied by 9.5 on the assumption that they were divided by that factor (i.e., the average number of years of protection)—the text of the RHCT report is silent on this point.

3) UNFPA costs include the provision of 120 condoms for dual protection (against pregnancy and STIs). This cost was removed so that unit costs would reflect only contraceptive costs.

4) RHCT estimates were adjusted using commodity cost data, which was obtained from the MOH and local NGOs, including ABBEF (the International Planned Parenthood Federation affiliate in Burkina Faso) and Marie Stopes International. The adjustment consisted of replacing RHCT commodity costs with these locally supplied commodity costs.

5) Further adjustments: (a) the cost of implants is divided by 3 to get the cost on a per-year basis, assuming three years of use before removal; (b) the costs of female and male sterilization are divided by 9.5, assuming an average of 9.5 years of protection from the age at the time of the procedure (age 35.5) until the end of the reproductive period (age 45); (c) the cost of injectables is multiplied by 4 to get one year of protection; and (d) the cost of IUDs is divided by 3 to get a per-year cost, assuming three years of use before removal.

6) Costs were inflated from the year of the studies to 2009 using World Bank GDP deflators for Burkina Faso and the United States, using simple averages (assuming that all costs have equally sized domestic and foreign components).[xviii]

7) Since no Burkina-specific information was available on male sterilization costs, unadjusted RHCT estimates were used, representing a regional (Sub-Saharan Africa) average. For "other supply methods," information on the cost of spermicides was used, assuming that 20 units equal a one-month supply.

8) Since none of the sources included indirect costs, the UNFPA (2009) estimate of the ratio of indirect costs (program and system costs) to direct costs for the Sub-Saharan Africa region are used to inflate all costs. The final per-user costs thus include both direct and indirect costs.

9) UNFPA indirect cost estimates include investments in physical infrastructure (maintenance of existing facilities and construction of new facilities), support programs (such as information, education and communication activities), systems for supplying commodities and management systems improvements.

b. Cost per user (per year) adjustments—maternal and newborn health care services

1) Singh et al. (2009) and UNFPA (2009) were the sources used for estimates of costs per client of maternal and newborn health (MNH) interventions, supplemented with data from the MOH and NGO sources.

2) RHCT estimates were adjusted with direct-input cost data (drugs plus labor) supplied by a Burkina health economist consulting with the MOH, the source of which were the MOH[xix] and local NGOs, including ABBEF and Marie Stopes International. The adjustment consisted of replacing RHCT direct costs with

these locally supplied direct costs. Where no additional information was available from Burkina, RHCT estimates were not adjusted (thus representing Sub-Saharan African averages).

3) Isolated cost estimates were incorporated from the literature. Data on the cost of deliveries came from Mugisha et al.,[xx] Newlands et al.,[xxi] Perkins et al.,[xxii] Storeng et al.,[xxiii] and Sondo et al.[xxiv]

4) Since iron supplementation and tetanus vaccination are modeled separately, these two elements were removed from the RHCT estimate of antenatal care costs.

5) Costs were inflated from the year of the study to 2009 using World Bank GDP deflators for Burkina Faso and the United States.

6) Since none of the sources included indirect costs, the UNFPA (2009) estimate of the ratio of indirect costs to direct costs for the Sub-Saharan Africa region were used to inflate all costs. The final per-user costs thus include both direct and indirect costs.

7. Adjustments for DHS data

Since some preliminary results for the 2010 DHS became available shortly before publication of this *In Brief*, some adjustments were made (many of which have already been noted above):

a. For contraceptive use rates, by method, DHS-2010 results were available for married women aged 15–49.

b. Adjustment factors, by method, were calculated by interpolating DHS-2003 and DHS-2010 results for the year 2009.

c. These adjustment factors were applied to all contraceptive prevalence rates (by marital status, wealth quintile and pregnancy intention status). For the sake of consistency, married women were given the same adjustment, even though more information was available for them.

d. Preliminary results for 2010 were also available for four MNH variables: seeing a skilled attendant for antenatal care, receiving tetanus shot during antenatal care, delivery at a health facility and delivery with a skilled attendant.

e. For these four variables, interpolated values were calculated by region. For quintiles, the average adjustment over the period 2003–2009 was used.

f. For other MNH variables (postpartum checkup, hemorrhage, sepsis, eclampsia, routine newborn care and iron supplementation) an overall adjustment factor (average of the four variables mentioned above) was used for all regions and quintiles.

g. Adjustments were also made for infant mortality rates and neonatal mortality rates, since DHS-2010 preliminary results were available.

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