

**Achieving the Millennium Development Goals in Kenya: The Contribution of  
Family Planning**

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## **Achieving the Millennium Development Goals in Kenya: The Contribution of Family Planning**

Although family planning received minimal attention in the original articulation of the Millennium Development Goals (MDGs) in 2000, its importance to achieving the MDGs now receives more consideration. For example, in the *Recommendations of the MDG Africa Steering Group (June 2008)*, members argue that progress can be accelerated towards achieving goals in many sectors through basic interventions, including provision of family planning services for all by 2015. *The Millennium Development Goals Report 2008* from the United Nations notes that the unmet need for family planning is the gap between women’s stated desires to delay or avoid having children and their actual use of contraception. It goes on to say that in sub-Saharan Africa “. . . nearly one in four married women has an unmet need for family planning, and the rise in contraceptive use has, on average, barely kept pace with the growing desire to delay or limit births.” It further argues that high unmet need “contributes to the continuing high fertility rate in that region and has undermined related goals, such as reducing child mortality, hunger and malnutrition, and increasing primary education enrolment.” Since 2005, indicators on unmet need and the contraceptive prevalence rate have also been included in the measurement of progress toward the MDGs.<sup>1</sup>

This analysis applies a benefit-cost framework to Kenya to explore whether increasing family planning and reducing unmet need can in fact help countries achieve the MDGs. Similar analyses have been performed for several other countries. See “Achieving the Millennium Development Goals: The contribution of fulfilling the unmet need for family planning”, by Scott Moreland and Sandra Talbird.<sup>2</sup>

### **I. Background**

#### ***Family Planning and Fertility Transition in Kenya***

Fertility started to decline in the early 1980s, but the findings from the 2003 KDHS indicated a stall in that decline. The reported total fertility rate was 4.7 in the 1998 KDHS and 4.9 in the 2003 KDHS. (Field work for the planned 2008 KDHS has been delayed.)

Survey <sup>3</sup>	Period for rates	Total Fertility Rate
1977-1978 KFS*	1975-1978	8.1
1989 KDHS*	1984-1989	6.7
1993 KDHS*	1990-1993	5.4
1998 KDHS*	1995-1998	4.7
2003 KDHS*	2000-2003	4.8
2003 KDHS	2000-2003	4.9

\* excludes the northern part of the country

<sup>1</sup><http://unstats.un.org/unsd/mdg/Host.aspx?Content=Indicators/OfficialList.htm>, cited February 2009

<sup>2</sup> Found at: <http://www.healthpolicyinitiative.com/index.cfm?id=publications&get=pubID&pubID=121>

<sup>3</sup> Fertility trend analysis can be found in Central Bureau of Statistics, Ministry of Health, and ORC Macro (2004). *Kenya Demographic and Health Survey 2003*. (Calverton, Maryland: CBS, MOH and ORC Macro), pp. 54-55.

Similarly, the modern contraceptive use increased slowly from 27 percent of married women of reproductive age in 1993 to 32 percent in 1998 and 33 percent in 2003—a gain of only six percentage points over a decade. At the same time, the unmet need for family planning remains high. KDHS 2003 reports that 24.5 percent of married women of reproductive age—one out of four—want to space or limit their births but are not using family planning.

The reasons for the stall in contraceptive prevalence and fertility are much discussed. A programmatic shift to HIV/AIDS clearly was a contributing factor. A loss of donor support due to political differences led to a decline in the successful community-based distribution program and a more erratic supply and distribution of contraceptives.<sup>4</sup>

Whatever the contributing factors, many advocates believe that reinvigorating the family planning program is fundamentally important to Kenyan development. To do so, Kenya will need strong commitment and support from its political and economic leadership. One way to build that support is to explore the links between family planning and national social and economic development goals.

Kenya's social and development goals are defined in the Kenya Vision 2030<sup>5</sup> and the medium term plan intended to help reach these objectives<sup>6</sup>. Goals for 2030 include reaching middle income status, social equity, and a clean and secure environment. The medium term plan identifies shorter term goals, including working towards universal primary education, reducing maternal mortality, and environmental sustainability.

### ***The Millennium Development Goals (MDGs)***

The United Nations Secretary General's Millennium Development Report, published in 2000, served as the framework for drafting the Millennium Declaration which was adopted at the Millennium Summit at the United Nations headquarters in New York in 2000. This document represents an international resolve to address development issues and poverty eradication by 2010 and to meet the special needs of Africa (United Nations, 2000). This process led to the adoption of the MDGs a year later, which serve as a roadmap for implementing the Millennium Declaration.

The final MDGs are a set of eight important time-bound goals that represent a blueprint for global development agreed to by member states of the United Nations and international development institutions. The goals are to

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<sup>4</sup> See, for example, "Joseph Karanja, Peter Njoroge and Solomon Orero (2005). "Impact of Trends in Community-Based Family Planning on Contraceptive Prevalence," in *A Closer Look at KDHS 2003: Further Analysis of the Contraceptive & Fertility Stalls: Summaries of Selected NCAPD Working Papers 2005*, (Nairobi: National Coordinating Agency for Population and Development and MEASURE Evaluation), p. 27.

<sup>5</sup> Government of Kenya (2007). Kenya Vision 2030: The Popular Version. (Nairobi: Ministry of State for Planning, National Development and Vision 2030).

<sup>6</sup> Government of Kenya (2007). Kenya Vision 2030: First Medium Term Plan 2008-2012. (Nairobi: Ministry of State for Planning, National Development and Vision 2030).

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria, and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development.

International goals similar to the MDGs are not new. Since the United Nations was created in 1945, it has participated in and promoted global goals—defined as quantitative, time-bound objectives set by the UN that are applied to a sizeable number of countries. Many of these goals have not been achieved, largely because they are easy and politically favorable to adopt, they are often impractical and not truly internalized by the countries themselves. The success of the smallpox eradication campaign in 1977, 11 years after the goal was set, is sometimes quoted as the exception to the rule. Richard Jolly conducted a review of global goals, and he found that no global goal has been achieved by the target date in *all* countries (Jolly, 2003). However, *some* countries have achieved or even surpassed several goals. According to Jolly, prominent goals that have been successful include:

- Small pox and polio eradication—small pox eradication was achieved in 1977 (11 years after the goal was adopted), and considerable progress has been made toward polio eradication though the disease has still not been wiped out
- Child immunization—the goal of 80 percent coverage in each of the six antigens was achieved in 64 developing and 26 transition countries during the 1980s
- Reduction of child deaths from diarrhea by half and diarrhea incidence by one quarter—achieved during the 1990s
- Reduction of infant mortality to below 120 by 2000—achieved in all but 12 developing countries
- Eradication of guinea worm—88 percent decline in cases worldwide.

The MDGs focus on human development and poverty reduction; they provide time limits and quantifiable outcomes that can be objectively measured and monitored; and they are consistent with the ICPD Plan of Action and other UN-supported goals. The MDGs are also consistent with the Kenyan development strategy laid out in the Vision 2030 and the medium term plan.

Africa is behind schedule to meet the MDGs<sup>7</sup>, which reinforces the notion that enhanced family planning should be considered as one strategy. The MDG Steering Group observes that as of mid-2008, the African continent, in its entirety, was lagging behind where it ought to be for each MDG goal. In part, there have been a number of

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<sup>7</sup> Easterly, William. 2007. How the Millennium Development Goals are unfair to Africa. Global Economy and Development working Paper 14. Washington, DC: Brookings Institute.

extraordinary obstacles that make achievement of the MDGs an even more formidable challenge for African countries. These include the world economic downturn, the recent rises in food prices, and the growing risk of natural disasters from climate change. In Kenya itself, recent political and ethnic conflict has worked against achievement of the MDGs.

## **II. Methodology**

This paper presents an analysis of how meeting the unmet need for family planning could help Kenya move towards achievement of the MDGs. It shows how increased use of family planning could lower the costs of meeting the MDGs. It further compares those cost savings with the extra costs of increased family planning using a benefit-cost framework.

The benefit-cost study is based on selected targets of five of the eight MDGs using a modeling approach. We present two population projections—one based on stable contraceptive prevalence and the other based on meeting 2003 levels of unmet need. We then estimate the extra cost of satisfying the unmet need for family planning. Next, we discuss scenarios and cost analyses based on five MDG models in the areas of education, child survival, maternal health, malaria, and water and sanitation. Lastly, using the benefit-cost framework, we compare the costs of family planning to the reduction in costs of meeting the five MDG targets.

## **IV. Family Planning Scenarios**

### ***Unmet Need for Family Planning***

A woman is defined as having an unmet need for family planning who is fecund, sexually active, not using any contraceptive methods, and who does not want a child for at least two years (“spacers”) or who does not want any more children at all (“limiters”). Unmet need is often presented as the percentage of married women of reproductive age who are spacers or limiters. The 2003 KDHS reported that 24.5 percent of married women of reproductive age have an unmet need for family planning, virtually the same level that was reported in the 1998 KDHS. Unmet need is not stationary. As unmet need is satisfied and contraceptive methods are more widely accepted and used, the demand for contraception can be expected to increase further.

### ***Population Projections***

Using the DemProj and FamPlan modules of the SPECTRUM suite of reproductive health policy models, we projected two population scenarios: (1) a “Base” scenario where unmet need is kept constant, and (2) a “Need Met” scenario, in which it is assumed that stronger family planning programs result in meeting current unmet need over time. Under the Base scenario, we held the CPR constant at its baseline through 2020. Under the Need Met scenario, we used a linear interpolation from the baseline CPR to meet current unmet need by 2020.

The FamPlan model is based on a proximate determinants framework. The four main proximate determinants that have a direct effect on fertility are marriage or union (age of marriage and proportion of women in union); contraception (proportion using contraception and effectiveness of method); abortion (proportion of pregnancies that are terminated); postpartum insusceptibility (lactational amenorrhoea or abstinence); and sterility. We took base year assumptions on marriage, contraceptive use, postpartum insusceptibility, and primary sterility from KDHS 2003. The induced abortion rate was extrapolated from a 1999 report by Stanley Henshaw that estimated the incidence of abortions worldwide at the regional and sub-regional level.

FamPlan also requires inputs for the contraceptive method mix and the effectiveness of different methods. We used the method mix from KDHS 2003 and held it constant through 2020. By keeping the method mix constant, the model does not assume a relative shift from traditional to modern methods or from one modern method to another. We took effectiveness estimates for different contraceptive methods from the default values in the FamPlan model.

### ***Cost Assumptions***

Two methods can be used to estimate the costs of FP programs: cost per FP user or cost per couple-year of protection. Cost per FP user is the (public sector) cost of providing FP services divided by the number of FP users. Cost per couple-year of protection (CYP) is the second method that can be used to estimate the cost of FP services. CYP is the number of couples protected from pregnancy in one year, as determined by the users of contraceptives during the year. For each contraceptive method, CYP coefficients are applied to convert contraceptive units to CYPs. For example, 13 units of oral contraception is the standard for providing one couple a full year of protection from pregnancy. In this case, if 13,000 oral contraceptive units are used, we would say that 1000 CYPs had been achieved. Cost per CYP included both commodity costs and service-delivery costs and is a more comprehensive measurement of cost than cost per FP user because it takes into account use of different contraceptive methods and the amount of contraception necessary to protect effectively from pregnancy. A study of 14 developing countries, including five African countries, found the weighted regional cost per CYP for African to be \$11.20 (Barberis and Harvey, 1997) which is the figure used in this analysis. The total cost of family planning was calculated under both population scenarios, and the cost of maintaining family planning at current levels was compared with the cost of meeting all unmet need.

## **V. Millennium Development Goal Scenarios**

### ***MDG Assumptions***

The MDG indicators are meant to monitor progress toward reaching the overall target for each MDG. As with any logical results framework, the indicators are linked conceptually to the goals (which have their own measurable targets). Improvements in indicators are

seen as progress toward reaching the MDGs. Reaching a target for an indicator, when there are multiple indicators for an MDG, does not mean that the MDG would be obtained. For example, if a country were to achieve 100 percent vaccination coverage for measles (one of the child survival indicators), it is taken to be a necessary, but not sufficient, condition to meet the child survival MDG of reducing the child mortality rate by two-thirds.

This report includes analysis for five of the MDG indicators. These include

- Net enrollment ratio in primary education
- Proportion of children age 1 immunized against measles
- Maternal mortality ratio
- Proportion of population with access to an improved water source/sanitation
- Proportion of children under age five sleeping under an insecticide-treated net

We didn't model all indicators for a goal, nor did we model all goals.<sup>8</sup> We selected those goals with targets that had clearly defined population based activities associated with their achievement. For example, we only modeled one of the three indicators for reducing child mortality—proportion of children under age one immunized against measles. Thus, each MDG scenario should be interpreted as only a portion of the total cost (and total savings) of actually achieving the goal. In this regard, the benefits that are discussed below are underestimates.

Data are based on the concerted efforts made by countries and international organizations, such as the UN and the World Bank, to monitor progress towards development goals. We used the UN Statistics Division's Millennium Indicators database for baseline MDG data. We then assumed that Kenya met its MDG targets by 2015 under both population scenarios. We assumed that progress toward the goal occurred linearly from the baseline until 2015.

We took unit cost data for each of the MDG indicators from a range of national and comparative international sources. By applying the unit cost to the population projections described above, we were then able to calculate the cumulative costs of achieving the MDG target by 2015 under both population scenarios.

### ***Universal Primary Education***

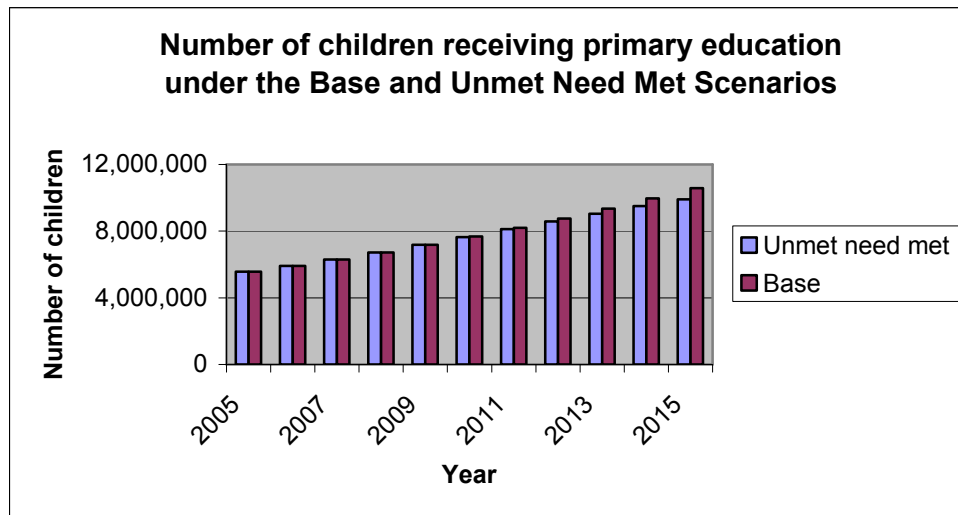
The second MDG is to achieve universal primary education. The target for this goal is to ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling. The key indicator with which we are concerned is the

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<sup>8</sup> It is reasonable to assume that some of the omitted goals and indicators would evolve similarly to those that were modeled—for example, Goal 3, “Promote gender equality and empower women,” and particularly Indicators 9 and 11 under that goal, “Ratios of girls to boys in primary, secondary and tertiary education” and “Share of women in wage employment in the non-agricultural sector.” Although we didn't analyze these indicators, it is reasonable to assume that increased FP use would have a positive impact on these two gender indicators.

net enrollment ratio or NER. The NER is the ratio of the number of students enrolled in school who are of school age divided by the school-age population times 100.<sup>9</sup> The Millennium Indicators Database reports a net enrollment ratio (NER) of 76.2 percent in Kenya in 2006. We assume an NER of 100 percent by 2015.

**Figure 1: Number of children receiving primary education under the Base and Unmet Need Met Scenarios**



By multiplying the number of children in the primary school ages, 6-13, by the NER, we can determine the number of primary students under each of the population projections, as seen in Figure 1 above. Based on Bruns et al (2003), we used a unit cost of \$68.7 in 2005 rising linearly to \$90.2 in 2015, to determine costs.

### *Proportion of one-year-old children immunized against measles*

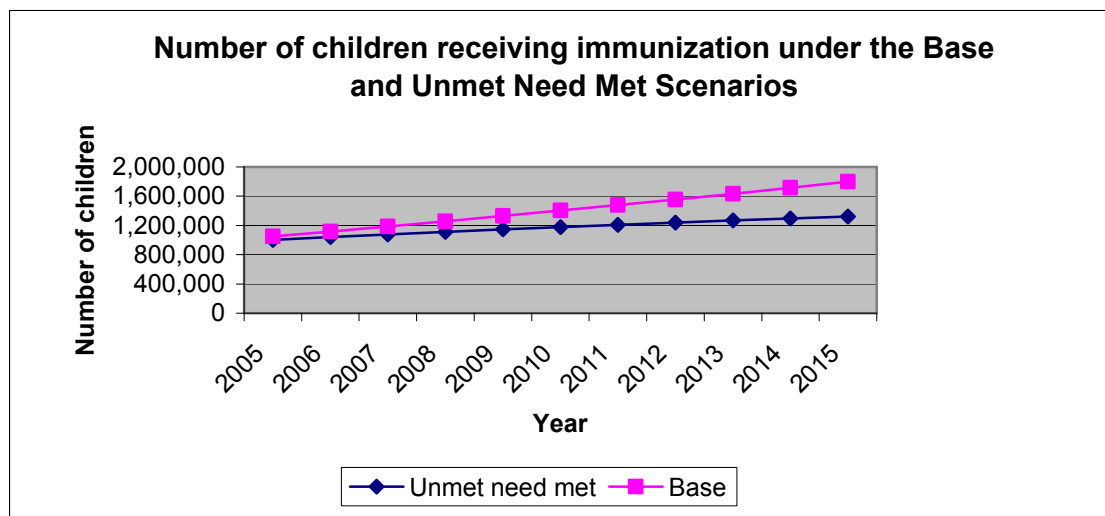
The fourth MDG is to reduce child mortality. The target for this goal is to reduce by two-thirds the under-five mortality rate. There are three indicators to measure progress toward reaching the target. In this analysis, we focus on MDG Indicator 15, the proportion of one-year-old children immunized against measles. Measles remains a leading cause of death among young children, despite the availability of a safe, effective and affordable vaccine for the past 40 years. By some estimates, 197,000 persons died from measles in 2007, mostly children under the age of five. Nonetheless, great strides are being made in reducing measles deaths. World Health Organization reports that from 2000 to 2007, about 576 million children were vaccinated against the disease in high risk countries. Over that period, global measles deaths dropped by 74 percent; in Africa, measles cases and deaths fell by a dramatic 89 percent (WHO Fact Sheet, 2008). The Millennium Indicators Database reports that 77 percent of Kenyan one-year-old children were immunized in 2006 (UNSD, Millennium Indicators Database, 2008).

<sup>9</sup> The alternative is the gross enrollment ratio or GER. The GER is defined as the ratio of all enrolled students to the school-age population times 100. Because students can be over or under the nominal school ages, GER can exceed 100 percent even when all children are not enrolled in school. For that reason, NER is a more effective indicator because it has a theoretical maximum value of 100 percent.



We calculated baseline data for the number of children who need the measles vaccine using UNSD coverage estimates and population estimates of children ages 0-12 months from DemProj. We then projected the number of children ages 0-12 months for each year from 2000-2015 under the two population scenarios. We assumed that the measles coverage rate would increase linearly from its 2005 level to 100 percent by 2015. We multiplied the projected number of children in each year by the coverage rate for that year to find the total number of additional children who would need to be vaccinated annually under each population projection. Over the 10-year period, we can then see the cumulative figure on how many fewer measles shots (and other immunizations) would be required by addressing the unmet need for family planning.

**Figure 2: Number of children receiving immunization under the status quo and MDG achieved scenarios**



According to WHO’s Expanded Program on Immunization (EPI), a fully immunized child should receive vaccines for six of the most common childhood diseases during the first year of life. These consist of a minimum of eight shots received in the first 9-12 months: Bacille Calmette Guerin (BCG) at birth; oral polio vaccine with diphtheria-pertussis-tetanus at 6, 10, and 14 weeks; and the measles vaccine at 9 months.

WHO and the UN Children’s Fund developed a comprehensive strategy for the sustainable reduction of measles mortality, including components to

- Provide one dose of measles vaccine to a high proportion of infants at nine months of age through routine immunization services. This is the foundation of the overall strategy.
- Give all children between the ages of 9 and 15 months a second opportunity for measles immunization, either through routine immunization services or through periodic mass campaigns.
- Establish and strengthen measles surveillance systems.
- Improve clinical management of measles cases.

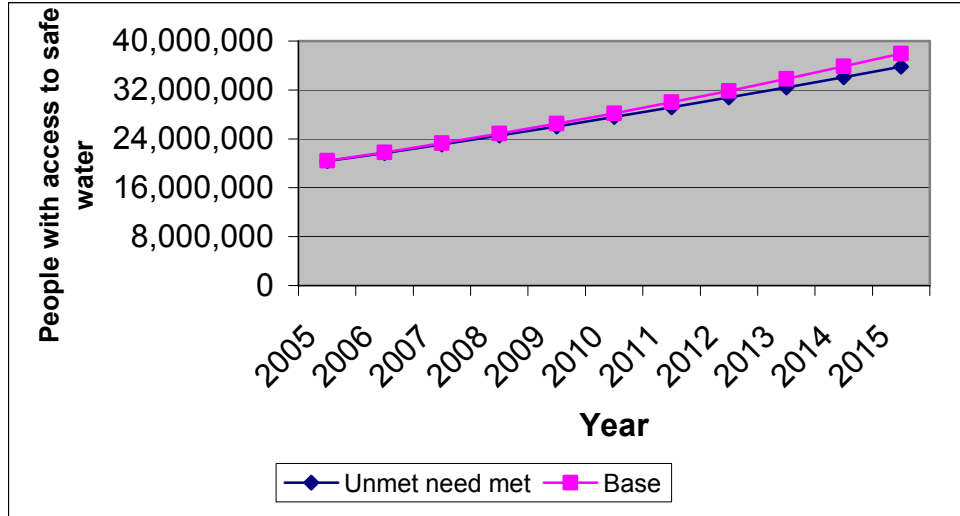
To estimate the cost of achieving 100 percent coverage of measles vaccinations, this study only costs the first part of WHO's four-pronged strategy: "Provide one dose of measles vaccine to a high proportion of infants at nine months of age through routine immunization service." Measles campaign costs are typically much lower than routine program costs, but outreach programs usually have much higher costs because of the extra time and money spent on advertising and travel. Thus, in this study, we depend on cost estimates for routine services. After much review of the literature, and in the absence of Kenya-specific information, we settled on an average cost per fully-immunized child of \$17 as a proxy of the cost of reaching the target of universal measles coverage for children under the age of one (John Snow Incorporated, PEV Model).

### ***Environmental sustainability***

The seventh MDG is to ensure environmental sustainability. There are three targets for this goal and seven indicators to measure progress toward reaching those targets. This analysis focuses on Target 10 which is to halve by 2015 the proportion of people without sustainable access to safe drinking water and sanitation. The key indicators are the proportion of the population with sustainable access to an improved water source and improved sanitation.

In general, the percent of people with access to an improved water source is higher than the percent with improved sanitation. We opted to model this MDG based on the percent of people with access to an improved water source because this would be a conservative estimate of costs (and therefore savings). We took baseline data on the percent of people with access to an improved water source and improved sanitation from the UNSD. We assumed that progress toward the goal of halving the proportion of people *without* access to improved water takes place in a linear fashion so that the proportion without access is halved by 2015. We then multiplied the percentage increase each year necessary to reach the goal by 2015 by the total population of the country under both population projections to calculate the number of "new" people with access to safe water and sanitation services. Total numbers of persons with access to safe water under the two scenarios are seen in Figure 3.

**Figure 3: Number of persons with access to safe water under the Base and Unmet Need Met Scenarios**

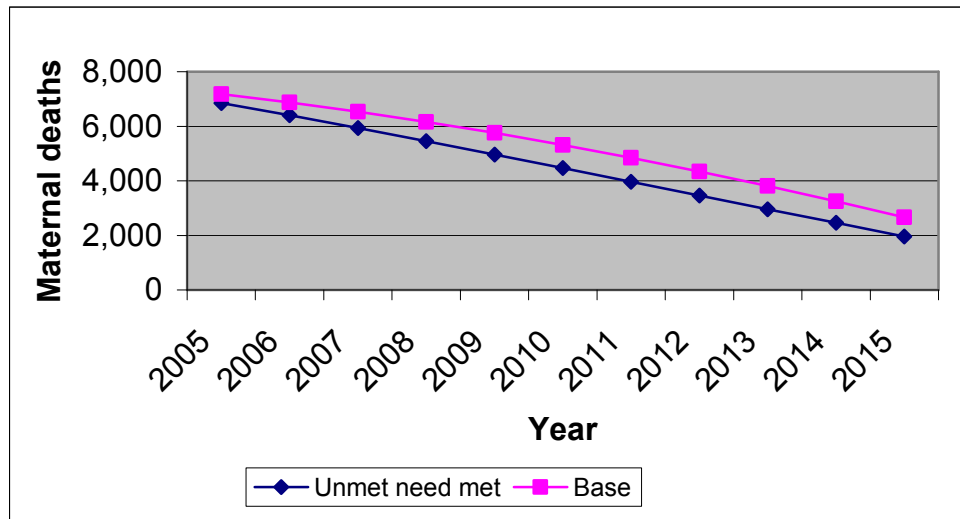


To estimate unit costs, we examined two reports estimating the cost of reaching the water and sanitation MDG. First, the Water and Sanitation Task Force Report performed a needs assessment of five developing countries for the UN Millennium Project. It estimates investment requirements for 2005, 2010, and 2025. Cost estimates include both capital and operating costs disaggregated by urban and rural areas and by water provision, sanitation and wastewater treatment. The report assumed gradual scaling-up of investments because, over time, operating and maintenance costs are generally higher than initial capital costs. Second, the Water, Sanitation, and Health Protection of the Human Environment Division of WHO conducted an analysis in 2004 estimating the costs of extending access to water supply and sanitation on a regional basis. Based on these studies, we used a conservative cost estimate of \$4.60 per person to improve safe water and sanitation.

***Reduction in maternal mortality ratio***

The fifth MDG is to improve maternal health. The target is to reduce the maternal mortality ratio (MMR)—the number of maternal deaths per 100,000 live births—by three-quarters between 1990 and 2015. We multiplied the number of births each year under the two population scenarios by the MMR for that year to estimate the number of maternal deaths that would occur during childbirth each year.

Figure 4: Maternal deaths under base and unmet need met scenarios



After the 1994 *ICPD Programme of Action*, which outlined reproductive health goals, efforts were made to estimate costs to implement the program. ICPD maternal health goals were broader and more encompassing than the MDGs; thus, ICPD cost estimates are higher than estimates to reach the maternal health goals defined by the MDGs. For purposes of estimating the unit costs of reducing the MMR by three-quarters at the country level, this study focuses on the unit cost estimates from literature examining programs to make pregnancy and safe motherhood safer in sub-Saharan Africa. Based on this literature, we used a cost-estimate of about \$30 per birth to provide safe motherhood services and reduce the MMR.

#### *Proportion of children under five sleeping under an insecticide treated net*

The sixth MDG is to combat HIV/AIDS, malaria, and other diseases. There are two targets for this goal and seven indicators to measure progress toward reaching those targets. This analysis will only focus on the proportion of the population using effective measures to prevent malaria, and, more specifically, the percent of children under age five using insecticide treated nets.

The *Roll Back Malaria* initiative reports that there are at least 300 million acute cases of malaria each year around the world. These result in more than a million deaths, 90 percent of which occur in Africa and mostly among young children. Malaria is, in fact, the leading cause of under-five mortality in Africa and places an enormous burden on African health systems.<sup>10</sup> The economic costs of malaria are also significant. Countries with high malaria transmission have historically had lower annual growth than countries without malaria, and malaria has been estimated to cost Africa more than US\$12 billion each year in lost gross domestic product.<sup>11</sup> Malaria not only results in lost life and lost

<sup>10</sup> <http://www.rollbackmalaria.org>. Infosheet as of 1/8/09.

<sup>11</sup> <http://www.rollbackmalaria.org>. Infosheet as of 1/8/09.

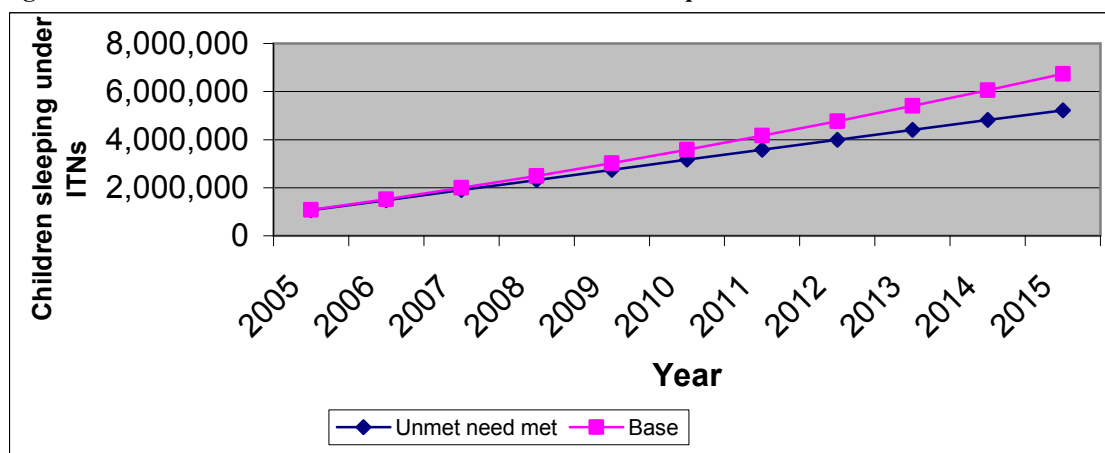
productivity, but also hampers the development of children through absenteeism in school and permanent neurological damage from severe episodes of malaria.

Insecticide-treated bed nets (ITNs) have been found to reduce the incidence of malaria by 50 percent compared with no nets and by 39 percent compared with untreated nets (Lengeler, 2004). A review of randomized control trials in Africa found ITNs can reduce the number of deaths in children under five by one-fifth, saving about five to six lives for every 1,000 children protected by ITN (Lengeler, 2004). This may even underestimate the efficacy of ITNs because nets treated with insecticide provide both a personal protection from mosquitoes as well as a community effect. This means that ITNs have been found to decrease the incidence of malaria among nonusers by reducing the number of mosquitoes in the area. ITNs are also highly cost-effective.

The Roll Back Malaria Partnership was formed in 1998 with the express goal of halving malaria mortality by 2010. The African Summit in Abuja, Nigeria in 2000 reinforced this goal, with African leaders agreeing to the target of at least 60 percent of children under the age of five and pregnant women using affordable insecticide-treated nets by 2010. The 2003 KDHS reported about 5 percent of children under five using insecticide treated bednets, though there are some indications of progress since then.

To estimate the number of required ITNs, we made assumptions regarding scale-up in coverage, the number of children protected by one net, and the average time period an ITN remains effective. First, we assumed that coverage increased in a linear manner to 80 percent by 2015, and calculated the number of children needing an ITN by multiplying the assumed coverage rate by the projected number of children under the age of 5 in that year. Second, we assumed that one ITN sufficiently covered two children, which is probably a high estimate. Third, instead of estimating the average life on ITN, we based unit cost estimates on a cost-per-treated-net-year, or the annualized cost of delivering a net and re-treating it every six months. The total number of children sleeping under an ITN each year under these assumptions is shown in Figure 3.

**Figure 5: Number of children under ITNs under the status quo and MDG achieved scenarios**



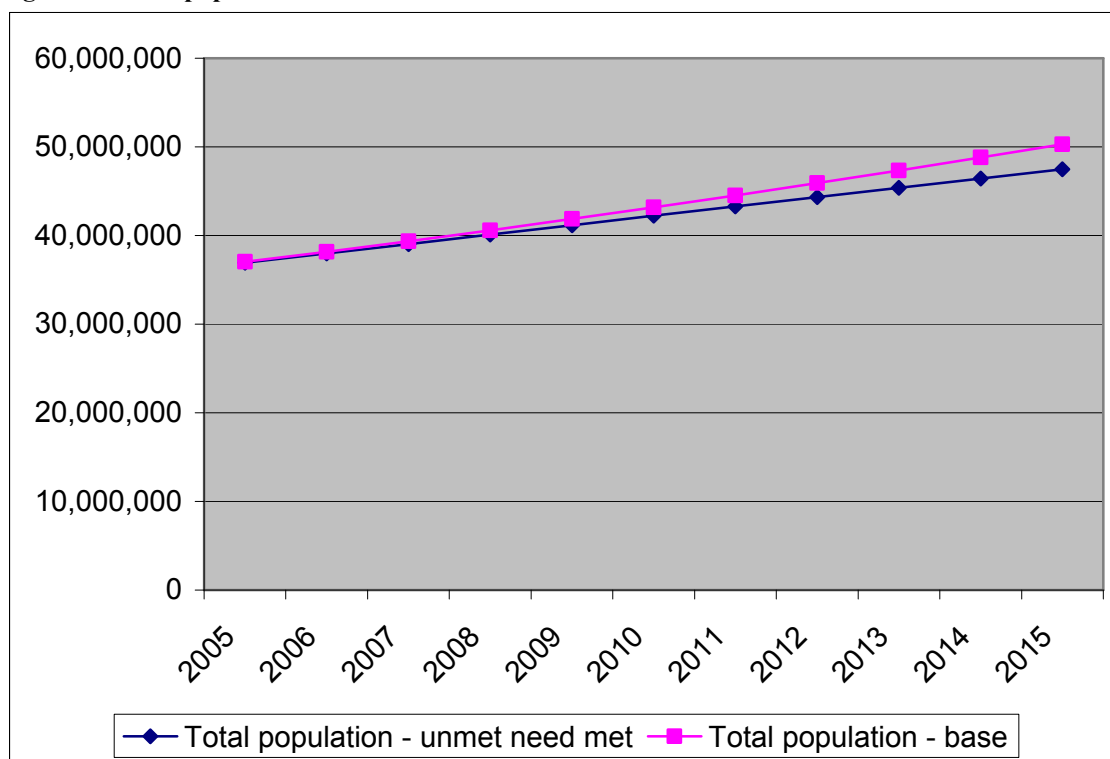
We reviewed cost estimates from several large-scale malaria prevention programs using ITNs, and opted to use an average cost of \$4.40 per treated net-year to estimate the cost of reaching the target.

## VI. Findings

Scenario 1. In the first scenario, we looked at the projections to the year 2015 which is the target date for the MDGs.

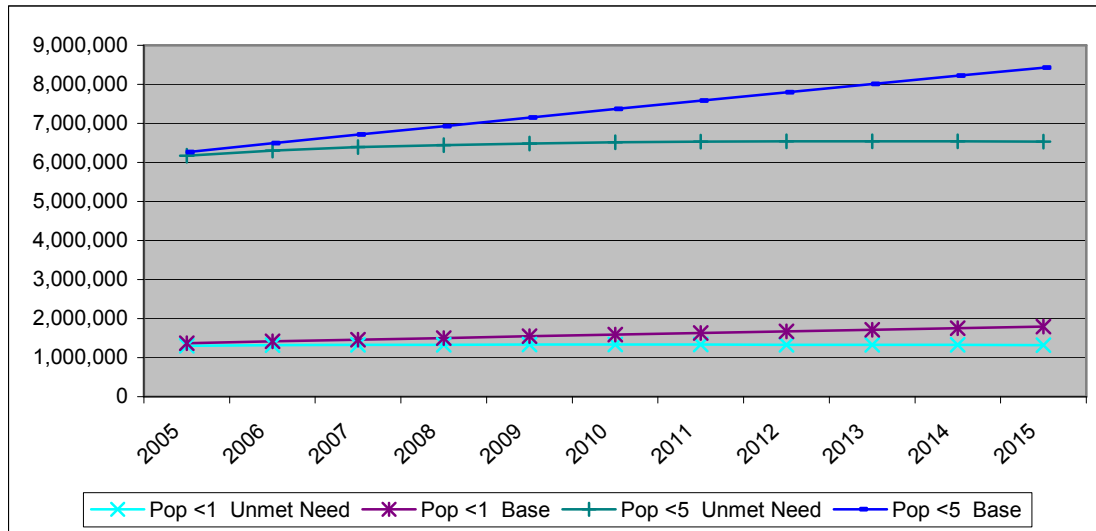
*Population Projections.* The population of Kenya would grow from 37 million in 2005 to 50.3 million in 2015 under the base projection where no progress is made in addressing unmet need and contraceptive prevalence remains steady. In contrast, in the unmet need satisfied projection (which assumes all current unmet need is met by 2020) the Kenya population would reach 47.5 million persons in 2015.

**Figure 6: Total populations under need met and base scenarios**



The primary school age population (6-13) would be 10.6 million in 2015 under the base projection versus 9.9 million under the unmet need projection. The under-5 population would be 8.4 million children in 2015 under the base projection but 6.5 million with the unmet need projection. The population under 1 year of age would be 1.8 million by 2015 under the base projection as against 1.3 million under the unmet need projection.

**Figure 7: Total under 1 and under 5 populations in the base and unmet need met scenarios**



*Family Planning.* The number of family planning users would be 2.8 million in 2015 under the base projection as against 4.1 million in that year with the unmet need projection. The estimated costs of providing FP services (using a CYP approach) would rise to \$31.3 million in 2010 and \$40.8 million in 2015 with the unmet need projection; in contrast, the estimated costs would be \$23.8 million in 2010 and \$27.2 million in 2015 with the assumptions used in the base projection. Over the 2005-2015 period, the cumulative costs for FP would be \$348.1 million under the unmet need projection versus \$262.3 million under the base projection, or a difference of \$85.9 million. When discounted, the difference is \$71.4 million between the two projections.

*Primary Education.* Both projections assume universal primary education by 2015. Under the base projection, annual primary education costs would increase from \$382.1 million in 2005 to \$954.8 million in 2015. Under the unmet need projection, annual primary education expenditures would rise from \$382.1 million in 2005 to \$893.4 million in 2015. The cumulative savings over the 2005-2015 period would be \$149.0 million with the unmet projection. When discounted, the cumulative savings would be \$114.7 million. Figure 4 shows the cumulative savings in education and the other sectors which follow.

For education, as for the other sectors, savings would be even greater if we compare costs for more years. For example, if the final year of the analysis were 2020, savings in the education sector would be \$550 million with the unmet need projection, rather than \$149 million.

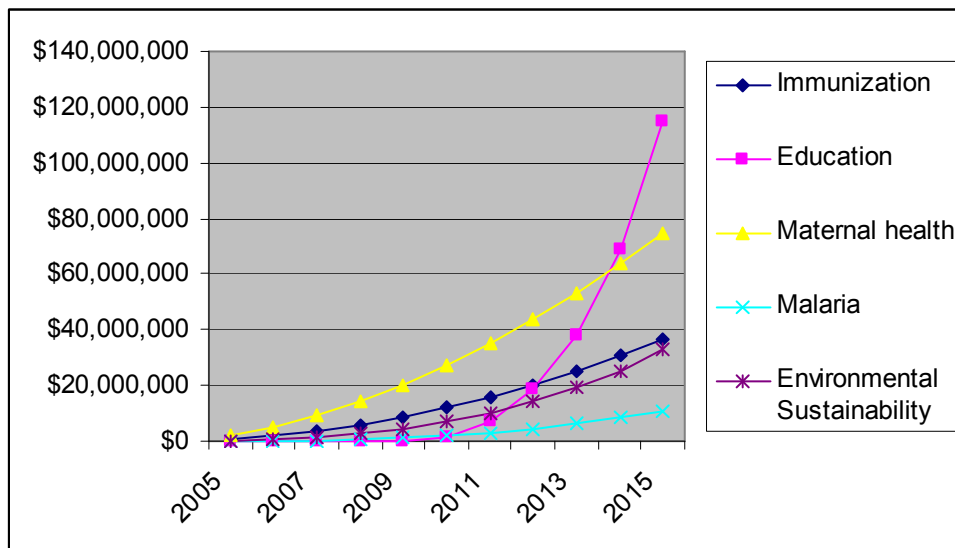
*Proportion of one-year-old children immunized against measles.* Assuming all one-year-old children are immunized each year by 2015, annual immunization costs would be \$23.9 million in 2010 and \$30.6 million in 2015 in the base projection, as compared to \$20.4 million in \$22.5 million in those years in the unmet need projection. The cumulative savings accrued by meeting unmet need would be \$44.7 million over the 2005-2015 decade. The discounted savings would be \$36.7 million.

*Access to safe water and sanitation.* Assuming the proportion of the population without access to safe water is halved by 2015 (to 25%), the cumulative cost over the projection period to provide new users with access to safe water and sanitation would be \$546.3 million in the base projection versus \$505.5 million in the unmet need projection. The cumulative savings would be \$40.8 million; the discounted savings would be \$32.8 million.

*Reduction in maternal mortality ratio.* Assuming the maternal mortality ratio is reduced by three-fourths by 2015 to 140 maternal deaths by 2015, cumulative expenditures for safe motherhood would be \$554.8 million in the base projection and \$464.1 million in the unmet need projection, a differential of \$90.7 million. Discounted savings would be \$74.9 million.

*Proportion of children under five sleeping under an insecticide treated net.* With the assumption that 80 percent of children under the age of five are sleeping under ITNs by 2015, the annual costs for ITNs in that year would be \$14.8 million under the base projection as against \$11.5 million under the unmet need projection. The cumulative savings if unmet need were met would be \$13.5 million over the 2005-2015 time span. The discounted savings would be \$10.8 million.

**Figure 8: Cumulative savings in each sector**





*Benefit-Cost Ratio.* The table summarizes these findings. When these five indicators are taken into account, the benefit-cost ratio is 3.78. This ratio suggests that addressing the

	2015	B/C Ratio
FP	\$71.37	
Education	\$114.70	1.61
Immunization	\$36.72	0.51
Water & Sanitation	\$32.75	0.46
Maternal Health	\$74.89	1.05
Malaria	\$10.75	0.15
Total	\$269.80	3.78

high unmet need for family planning in Kenya is one strategy to help the country achieve the MDGS.

Scenario 2: It is now 2009 and 2015—the target date for the MDGs—is a mere six years away. In actuality, many African countries are going to fall short of the MDGs. Accordingly, we present a second analysis that uses the same set of assumptions as above, excepting that the MDG targets are met in 2020, rather than 2015.

	2020	B/C Ratio
FP	\$132.65	
Education	\$550.55	4.15
Immunization	\$70.01	0.53
Water & Sanitation	\$81.92	0.62
Maternal Health	\$180.88	1.36
Malaria	\$21.83	0.16
Total	\$905.19	6.82

Not surprisingly, in that case the benefit-cost ratio is even higher, given that the population scenarios diverge even farther as time passes – there are greater differences in the number of children needing education and immunization and the number of persons needing safe water and sanitation, mosquito nets and maternal health care. For every dollar spent on family planning to address unmet need, Kenya would save 6.82 dollars in these five areas. Thinking even farther into the future, such as the 2030 end year of the Kenya Vision for 2030 would imply even greater cost savings for current investment in family planning.

## **VI. Discussion**

When formulated in 2000, the Millennium Development Goals did not address high fertility, high unmet need, and rapid population growth as fundamentally important to

social and economic development in many developing countries. After much lobbying, the United Nations added new indicators in 2005: contraceptive prevalence rate and unmet need. The MDG Steering Group now sees high unmet need as a brake on efforts to achieve the MDGs and other development goals. Using a benefit-cost framework and Kenya as a case study, this analysis confirms that reducing the high unmet need for family planning could help countries make progress towards achieving the MDGs. By reducing the costs of providing services to the population countries will find it easier to achieve results, be it in the MDGs or in other areas.

From the other perspective, the MDGs have an imaginative appeal and—despite the fact that 2015 rapidly approaches—continue to have a profound influence on development thinking in many countries. In countries where fertility remains high or where fertility transition has stalled, linking family planning to the ability to achieve the MDGs is a powerful way to advocate for renewed efforts to address the high unmet need for family planning services.

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