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# COSTS OF INDUCED ABORTION AND COST-EFFECTIVENESS OF UNIVERSAL ACCESS TO MODERN CONTRACEPTIVES IN UGANDA

Over 37% of Ugandan women want to postpone or limit childbearing but are not currently using modern contraception.

6.9

The average number of children that Ugandan women have over their reproductive lives.

The cumulative national expenditure on induced abortion in 2009 was more than 4% of Uganda's annual health care expenditure.

With a population of nearly 30 million and an annual population growth rate of 3.2 percent, Uganda is the third fastest-growing country in the world.<sup>1</sup> Recent Demographic and Health Surveys indicate that only 31 percent of Ugandan women of reproductive age who want to use contraceptives report that they are indeed using a modern effective method. Over 37 percent of women want to postpone or limit childbearing but are not currently using modern contraception—these women have an unmet need for family planning.<sup>2</sup> To respond to the high level of unmet need, the Ugandan government has begun to include family planning in its health program and has acknowledged that a high level of unmet need for family planning may negatively affect women's health and overall well-being (see box, page 2).

This research brief highlights findings from two recent studies led by Joseph Babigumira and researchers at the University of Washington and in Uganda. Both studies use health economics methods to:

- Investigate the economic consequences of not responding to unmet need for contraception.
- Inform policymakers about the benefits of increasing family planning coverage.

The first study, published in 2011, assesses the costs and the economic burden associated with induced abortions in Uganda; the second study, completed in 2012, examines the potential costs and health benefits to increasing access to modern contraceptives. The two studies agree that providing greater access to contraception in Uganda may be highly cost effective by alleviating unmet need for family planning services, reducing the incidence of induced abortions and abortion-related complications, and promoting overall reproductive health and well-being.

## The Costs of Induced Abortion

Abortions are illegal in Uganda under all circumstances except to save the life of the mother. Despite the legal barriers and health risks, the demand for induced abortions in Uganda is high. In 2009, there were an estimated 362,000 cases of induced abortion in Uganda.<sup>3</sup> Moreover, the high number of unintended pregnancies, a result of the very high unmet need for contraception, keeps the demand high for abortion services.

Abortion-related complications are associated with numerous adverse health consequences and exert a substantial cost burden on the Ugandan health care system. The 2011 study aimed to:

- Identify the health and economic impact of induced abortions and abortion-related complications.
- Estimate the cost burden associated with induced abortions.<sup>4</sup>

To perform the analysis, the researchers developed a decision tree model that identified the possible health outcomes and costs associated with an induced abortion. The model shows the consequences of an abortion in several stages:

- Women seek abortion services from trained practitioners or from untrained providers.
- Women who receive abortion procedures from the different providers are further grouped by whether the induced abortion succeeds or fails.
- Women who have successful induced abortions are divided by whether or not they develop post-abortion complications.

- Women who develop complications are further classified by whether they require outpatient care or hospital care, and whether they have access to such care and services.
- Women who need hospital treatment following abortion complications but are unable to access it are divided into those who die at home and those who belatedly seek hospital care, which is commonly reported in Uganda.
- In the case of abortion failure by a practitioner, the model assumes that women carry the pregnancy and face pregnancy-related consequences.

Three types of costs incurred by women and their families were obtained from published data sources. Probabilities were calculated and assigned to each event at every stage:

- Direct medical costs, which include costs for medical supplies, tests and screenings, and any out-of-pocket expenditures.
- Direct nonmedical costs, such as transportation costs, while seeking health care.
- Indirect costs, which encompass loss of time and productivity while seeking abortion services and getting treatment for complications.

The study also estimated the total direct cost incurred by women and their families (the direct medical and nonmedical costs associated with procuring an abortion), and the total government costs associated with treating abortion-related complications.

In addition, the societal costs of induced abortion are estimated by aggregating direct medical and nonmedical costs incurred by women and their families, indirect costs associated with time and productivity loss, and total government costs.

## Key Results

An induced abortion is associated with \$177 in societal costs, four times higher than the level of per capita health expenditure in Uganda. Moreover, 52 percent of the total societal cost can be attributed to indirect costs and costs associated with productivity loss, while the remaining 48 percent is associated with the direct costs for providing health care. Women and their families bear over 83 percent of the total direct cost burden associated with induced abortion, whereas the government, which is the primary health care provider in Uganda, incurs only 17 percent.

Based on the estimated number of induced abortions that were performed in 2009, the researchers estimated that the cumulative national expenditure on induced abortion in 2009 was \$64 million in societal costs—more than 4 percent of Uganda's total annual health care expenditure of approximately \$1.5 billion.

Given the increased demand for induced abortion because of the high number of unintended pregnancies, the analysis emphasizes the need to improve contraceptive coverage. The substantial costs associated with unsafely induced abortions in

## Unmet Need, Unintended Pregnancy, and Induced Abortion in Uganda

In Uganda, low levels of contraceptive use and widespread unmet need are associated with large numbers of unintended pregnancies and unplanned births. Studies show that the number of unintended pregnancies and births in Uganda remains high—almost half of all births in 2006 were unplanned.<sup>1</sup> Sexually active women who do not use contraception and do not want to have more children are at high risk of having an abortion should they become pregnant. Ugandan law permits an abortion only when a pregnancy endangers a woman's life; under these restricted conditions, legal abortions are rarely approved.<sup>2</sup> Nevertheless, induced abortions in Uganda are common and usually result in serious health complications because procedures are often performed by untrained personnel in unsafe, unhygienic environments. Furthermore, treatments for abortion-related complications are costly and consume scarce medical and health resources, and many women who receive induced abortions suffer from short-term and long-term health consequences.

In Uganda, two of every five pregnancies end in induced abortion, and one in two pregnancies are unintended. These data are consistent with the high level of unmet need for contraception in Uganda.<sup>3</sup> A significant part of this unmet need may be attributed to a lack of access to contraceptive methods. Two of every three Ugandan women who want family planning do not have access to modern methods of contraception, in spite of government efforts to increase coverage. Moreover, the range of methods provided at health facilities, particularly at the district and local levels, is limited. Although increasing access to contraceptive methods may be beneficial to women and their families, Uganda's publicly provided health care system has many competing health and development needs because of severe budget and resource constraints. Consequently, many public health interventions, including efforts to improve contraception coverage or to provide safe and legal abortions where permitted, are compromised.

### References

- 1 Uganda Bureau of Statistics (UBOS) and Macro International Inc., *Uganda Demographic and Health Survey 2006* (Calverton, MD: UBOS and Macro International Inc., 2007).
- 2 Susheela Singh et al., *Unintended Pregnancy and Induced Abortion in Uganda: Causes and Consequences* (New York: Guttmacher Institute, 2006).
- 3 Florence M. Mirembe, "A Situation Analysis of Induced Abortions in Uganda," *African Journal of Fertility, Sexuality, and Reproductive Health* 1, no. 1 (1996): 79-80.

TABLE 1

## Contraceptive Use Under CCP and NCP

	CURRENT PROGRAM (CCP)		NEW PROGRAM (NCP)	
	NUMBER	%	NUMBER	%
All Sexually Active Women Who Desire Contraception	3,200,000	100.0	3,200,000	100.0
No contraception	1,952,000	61.0	0	0
Any method	1,248,000	39.0	3,200,000	100.0
Any modern method	992,000	31.0	3,200,000	100.0
Female sterilization	108,800	3.4	352,000	11.0
Male sterilization	6,400	0.2	19,200	0.6
Pill	147,200	4.6	473,600	14.8
Intrauterine device (IUD)	6,400	0.2	19,200	0.6
Injectable	496,000	15.5	1,600,000	50.0
Implants	19,200	0.6	60,800	1.9
Male condom	204,800	6.4	659,200	20.6
Any traditional method	256,000	8.0	0	0
Rhythm	124,800	3.9	0	0
Withdrawal	86,400	2.7	0	0
Folk methods	44,800	1.4	0	0

Source: Joseph B. Babigumira et al., "Potential Cost-Effectiveness of Universal Access to Modern Contraceptives in Uganda," *PLoS one* 7, no. 2 (2012): 1-9.

Uganda highlight the need to make family planning information and services more available to Ugandan women and couples who want them; to reduce the number of unsafe abortions; and to provide safe and legal abortion and post-abortion care services as permitted under Ugandan law.

## Increased Access to Contraception: A Cost-Effectiveness Analysis

A second study examined two closely related questions: How would increasing contraceptive coverage affect women's health and well-being in Uganda? Would such an intervention be a good use of scarce health resources? To answer these questions, Babigumira and colleagues compared a hypothetical new program, which would provide universal access to modern contraception, to the current program based on 2006 DHS data, where contraceptive availability is poor.<sup>5</sup> The study:

- Defines the analytic approach used in a new hypothetical program.
- Examines changes in sexual activity, contraceptive use, and pregnancy over a woman's life course under the new program.

- Calculates the costs and benefits associated with key health indicators under the new program.
- Compares the projected costs and benefits associated with the hypothetical new program to those associated with the current program.

The study used 2006 DHS data to identify the distribution of Ugandan women who were either using a modern method, a traditional method, or not using a method under the current program but did not want to become pregnant for two years or more. Assuming that these women all have an interest in using modern contraception, the researchers applied the same contraceptive method mix observed by women in the 2006 survey to the expanded group of women. Consequently, if the new program had been implemented in 2006, an estimated 3.2 million sexually active Ugandan women of reproductive age who desired contraception would have been given access to and would have used modern methods. Through maintaining the same method mix, the new program simulates an environment in which all women who want to avoid pregnancy have access to contraception and unmet need for family planning is eliminated.

Table 1 illustrates the contraceptive method mix used by women who desire a contraceptive method under the current program (CCP) and under the hypothetical new program (NCP).

TABLE 2

## Cost-Effectiveness Analysis and Program Comparison

		COST PER WOMAN (2010 USD)	INCREMENTAL COST PER WOMAN (2010 USD)	DALYS AVERTED PER WOMAN (YEARS)	INCREMENTAL DALYS AVERTED PER WOMAN (YEARS)
<b>Societal Perspective</b>	Current Program	\$1,987		27.01	
	New Program	\$1,949	\$38 SAVED	27.38	0.37
<b>Governmental Perspective</b>	Current Program	\$684		27.01	
	New Program	\$636	\$48 SAVED	27.38	0.37

Source: Joseph B. Babigumira et al., "Potential Cost-Effectiveness of Universal Access to Modern Contraceptives in Uganda," *PloS one* 7, no. 2 (2012): 1-9.

Using the new distribution as a starting point, the study developed a Markov cohort model to simulate the impact of the new program on the reproductive health experiences of Ugandan women over the course of their lives. The simulation follows a hypothetical cohort of women who move between seven health states starting at age 15 (approximately the median age of sexual debut in Uganda) and ending at age 49 (assumed to be the end of a woman's reproductive lifetime).<sup>6</sup>

The two programs are compared across three measures:

- Total costs (direct and indirect costs, medical and nonmedical).
- Life expectancy (measured in life years), and disability-adjusted life expectancy.
- Cost effectiveness, defined as cost per life-year saved and cost per disability-adjusted life-year (DALY) averted. (One DALY is equivalent to one year of healthy life lost.)

The analysis also compares the two programs across indicators of health status, including indicators associated with pregnancy and pregnancy-related complications; and measures of neonatal, infant, and child mortality.

In the model, only two health states—pregnancy and modern contraception—incur any costs. All other states in the model—sexual inactivity, intentionally not using contraception, using traditional family planning methods, unintentionally not using contraception, and death—are assumed to have no costs. For the two programs, costs were calculated for pregnancy and modern contraception use, accounting for expenditures incurred by the government (Ugandan Ministry of Health) as well as societal costs. Governmental costs include direct and indirect medical costs incurred by the Ministry of Health, the primary health care provider in Uganda. Societal costs include governmental costs, any direct nonmedical expenditure by patients (such as transportation costs), and costs resulting from lost productivity.

## Key Results

The study predicted that for a cohort of 100,000 15-year-old Ugandan women, the new hypothetical program would result in reduced costs and more favorable health outcomes, thereby outperforming the current program.

Given the expected expansion in contraceptive services under the new program, program costs would be higher than under the current program. Societal costs under the new program would be higher by \$225 per woman and governmental costs would be higher by \$52 per woman. However, medical costs per woman under the new program would be lower from both societal (\$263) and governmental (\$101) perspectives. The lower medical costs under the new program would offset the higher program costs, making the new program less costly than the current program. In fact, the analysis shows that increasing access to contraception under the new program would lower societal costs by \$38 per woman, lower governmental costs by \$48 per woman, and save close to \$4 million.

The analysis also highlights the positive relationship between increased contraceptive coverage and improved maternal and child health outcomes. Under the new program, the total fertility rate would decrease from 6.9 children per woman to 5.8 children per woman. In addition, women would have fewer abortions, miscarriages, and stillbirths. Child and infant mortality rates would also decrease under the new program.

When assessing life expectancy indicators, the study suggests that women would live longer under the new program (27.38 DALYs averted per woman) than under the current program (27.01 DALYs averted per woman).

The estimates from the analysis indicate that the new program is both less expensive and more effective than the current program (see Table 2). Under the new program, increasing contraceptive use would result in more favorable health outcomes (higher

DALYs averted per woman) and lower costs than under the current program. In health economics terms, the new program is said to “dominate” the old program and such a program is the best possible use of scarce resources. On the other hand, competing health interventions, such as treatment for measles or home-based antiretroviral therapy, while worth spending resources on, would not provide the same level of benefits from a societal and from a governmental perspective.

## Policy Implications

Many studies have shown that contraception has a positive impact on maternal and child health outcomes. In a country like Uganda, which has one of the highest maternal mortality rates in the world at 435 maternal deaths per 100,000 live births, limiting unintended pregnancies can decrease women’s risks from unsafely performed abortions, miscarriages, and complicated pregnancies.<sup>7</sup> The benefits of universal access would be critical in alleviating abortion-related complications and allowing couples to have the number of children they desire.

The health economics studies highlighted in this brief indicate that, in addition to the health benefits associated with universal access, increasing contraceptive coverage is an effective use of scarce health care resources. Improving access to family planning is essential to reducing unintended pregnancies and induced abortions. The researchers encourage policymakers to focus on solutions that:

- Improve contraceptive supply, especially at lower-level health care facilities.
- Broaden the range of contraceptive methods offered at hospitals and clinics.
- Expand contraceptive service delivery strategies that serve people in remote areas.
- Train more health care providers in family planning counseling and service delivery, especially for long-acting and permanent methods (such as intrauterine devices, implants, and sterilization).
- Improve public knowledge of contraceptive methods.

At a minimum, the results suggest that family planning and reproductive health care should be a high priority in Uganda and should be covered under the national health care scheme. The benefits from such high-impact policy efforts can contribute to Uganda’s health, social, and economic development.

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- 4 Joseph B. Babigumira et al., “Estimating the Costs of Induced Abortion in Uganda: A Model-Based Analysis,” *BMC Public Health* 11, no. 1 (2011): 904.
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- 6 The seven stages of the Markov model are: not sexually active; intentional noncontraception; modern contraception; traditional contraception; unintentional noncontraception; pregnant; and death.
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