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Effect of an Expansion in Private Sector Provision of Contraceptive Supplies on Horizontal Inequity in Modern Contraceptive Use: Evidence from Africa and Asia

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Effect of an Expansion in Private Sector Provision of Contraceptive Supplies on Horizontal Inequity in Modern Contraceptive Use: Evidence from Africa and Asia

December 2010

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Abstract

One strategic approach available to policy makers to improve the availability of contraceptive supplies as well as the sustainability of family planning programs is to expand the role of the private sector in providing access to contraceptive supplies. However, critics of this approach argue that increased reliance on the private sector will not serve the needs of the poor, and could lead to increases in socio-economic disparities in the use of modern contraceptive methods. The purpose of this study is to investigate whether the expansion of the role of private providers in the provision of modern contraceptive supplies is associated with increased horizontal inequity in modern contraceptive use. The study is based on multiple rounds of Demographic and Health Survey data from four selected countries (Nigeria, Uganda, Bangladesh, and Indonesia) in which there was an increase in the private sector supply of contraceptives. The methodology involves estimating concentration indices to assess the degree of inequity in contraceptive use by wealth groups across time. In order to measure modern contraceptive prevalence rate (MCPR) inequity, the study controls for differences in the need for family planning services in relation to household wealth. Overall, the results suggest that the expansion of the private commercial sector supply of contraceptives in the four study countries did not lead to increased MCPR inequity. In fact, in three of the four study countries (Nigeria, Uganda, and Indonesia), MCPR inequity actually decreased over time; while in the fourth study country (Bangladesh), MCPR inequity fluctuated. Overall, the results offer support to the premise that government strategies that promote the role of the private commercial sector can help facilitate the achievement of equity objectives.

1. Introduction and Background

Over the past 10 years, the demand for family planning (FP) services has increased dramatically due to large increases in modern contraceptive prevalence rates (MCPR) and growing numbers of women entering childbearing ages in many low- and middle-income countries [1]. However, during the same period, donor financing for family planning programs has diminished and, in some countries, been phased out [2]. Taken together, both trends can potentially threaten the continuation of current levels of MCPR as well as progress towards the long-term sustainability of family planning programs.

One strategic approach available to policy makers to improve the availability of contraceptive supplies as well as the sustainability of FP programs is to expand the role of the private sector in providing access to contraceptive supplies. There are a number of arguments that are used to support this type of strategy. First, the private sector may be more efficient than the public sector in the provision of supplies to those couples who are willing and able to pay, particularly those who live in urban areas. Secondly, a strategy that involves working with the private sector can help mobilize additional resources for family planning programs. Third, increasing the private sector's market share can potentially allow family planning programs to better target the poor and other vulnerable households who have limited physical and financial access to family planning services. However, critics of this approach argue that increased reliance on the private sector will not serve the needs of the poor, and could lead to increases in socioeconomic disparities in the use of modern contraceptive methods.

There is very little research available that investigates the relationship between the expansion of the private sector in the provision of contraceptive supplies and socioeconomic disparities in modern contraceptive use. One exception is a recent study by Agha and Do [3], which employed population-based survey data from five countries – Morocco, Indonesia, Kenya,

Ghana, and Bangladesh. The authors found no support for the hypothesis that an increase in the private sector supply of family planning services leads to socioeconomic inequality in the MCPR.

The purpose of this study is to revisit the question of whether the expansion of the role of private providers in selected countries in Africa and Asia has led to an increase in inequality in modern contraceptive method use. The countries included in the analysis are Uganda, Nigeria, Bangladesh, and Indonesia, countries that have experienced an increase in the share of women who report using the private commercial sector for their contraceptive supplies.

The study methods build on those of Agha and Do [3]. Like that study, we use multiple rounds of Demographic and Health Surveys (DHS) data for selected countries in which there was an increase in the private sector supply of contraceptives to estimate concentration indices, which assess the degree of inequality in contraceptive use by wealth groups, across time. We define inequality as differences in contraceptive use between wealth groups. However, it is different from inequity, which we define as unequal use for equal need (horizontal inequity) [4]. In our case, inequality is unequal contraceptive use between wealth groups, regardless of need for family planning; inequity is defined as differences in contraceptive use, given the potentially different need for family planning. For example, if women in richer households are more likely to use a modern contraception method than women in poorer households, then the inequality does not necessarily mean that there is inequity because the variation in contraceptive use between wealth groups might be explained by socioeconomic variation in the need for family planning. In order to measure the extent to which there is MCPR inequity in each of the study countries, the study controls for differences in the need for FP services in relation to household wealth. This allows us to measure the extent of horizontal inequity in contraceptive use. Second, the study includes Uganda and Nigeria, two sub-Saharan African countries not included

in Agha and Do [3]. Third, for Bangladesh and Indonesia, two countries that were included in Agha and Do [3], we incorporate into our analysis of trends a more recent DHS round.

This paper is organized as follows. After this introductory section, section 2 describes the data and methods used in the study. Section 3 presents for each of the four study countries a brief overview of the evolution of the family planning program and the empirical results of our analysis. Finally, section 4 presents a discussion of the results and the policy implications for family planning decision-makers interested in improving the availability of FP services as well as the sustainability of FP programs.

2. Data and Methods

Data sources

This study utilizes data from DHS, which are nationally representative population-based surveys of women of reproductive age (15 to 49 years of age). The use of standardized questionnaires in the DHS makes it possible to examine changes in the variables of interest across multiple countries. For each country included in the study, the final sample consists of women of reproductive age who are either currently married or living in union.

Inclusion criteria

DHS have been conducted in almost 80 low- and middle-income countries around the world. For the purposes of this study, countries were initially selected if: a) there were at least three rounds of DHS available; and b) there was an expansion in the private commercial sector as source of supply for modern contraceptives in three consecutive surveys. The initial search for countries that met our criteria was conducted using STAT COMPILER, which includes data from all DHS [5]. This was followed by accessing each of the available DHS data sets for

countries that were identified and then eliminating those countries where the private commercial sector share did not expand, using the study's definition of the private commercial sector (which does not include nongovernmental organizations [NGOs]). After applying these criteria, the following seven countries remained: Nigeria, Uganda, Namibia, Zimbabwe, Morocco, Indonesia, and Bangladesh. Due to the budget constraint of the study, we selected four of these countries: Nigeria, Uganda, Bangladesh, and Indonesia. Of the four, two countries were not included in the analysis by Agha and Do [3]. For the two countries also included in Agha and Do [3], Bangladesh and Indonesia, more recent DHS were conducted and made available in each country, which provide an opportunity to test the robustness of the results. Table A1 in the appendix presents the surveys used for each of the four study countries and their respective sample sizes.

Variables

The variable of primary interest in the study is current modern contraceptive use, a binary variable derived from the responses to the question, "Are you currently doing something or using any method to delay or avoid getting pregnant?" and, for those women who answered yes, "Which method are you using?". The methods classified as modern are male condoms, pills, intrauterine device (IUD), injections, diaphragm/foam/jelly, female sterilization, male sterilization, and Norplant. Lactational amenorrhea method (LAM) was not classified as a modern method.

Also of interest is an indicator of whether the woman received her contraceptive supplies from a private commercial provider. This indicator is based on the response to the question asked to women who were using a contraceptive method, "Where did you obtain [current method] the last time?" For the purposes of this study, we define the private commercial sector

as consisting of those commercial outlets that sell contraceptive supplies and services, including chemists, shops, pharmacies, traditional healer/doctor, midwife, and private health care facilities and workers. This excludes NGOs and faith-based organizations (FBOs). Based on this definition, we generated an indicator of the source of supply with three categories: the private commercial sector, the government sector, and other sources (NGOs, relatives, friends, and others). We then used this variable to assess changes over time in the extent to which women received her supplies from a private commercial sector outlet "the last time" the method was obtained.[1] Table A2 in the appendix provides more details on the categorization of the sources of supply for each country.

In order to control for the need for family planning in the equity analysis, a variable was generated from the responses to questions on the desire for more children at the time of the survey. Like the commonly used measure of unmet need, we classified women who wanted a child within the next two years and women who were "infecund" (barren) as not being in need of contraception. All other women were classified as being in need of contraception. This includes women who: 1) wanted a child no sooner than two years following the survey, 2) wanted a child but were unsure of the timing, 3) were undecided on whether they wanted more children, 4) did not want more children, 5) were sterilized at the time of the survey, 6) were currently pregnant at the time of the survey but had wanted the current pregnancy later or not at all, or 7) were postpartum amenorrhic and who had wanted the last birth later or not at all. Furthermore, all contraceptive users who had missing information on the "desire for more children" were also

[1] For Indonesia, the PPKBD (village family planning posts), posyandus (health posts), and polindes (delivery posts) have been classified as public facilities in the 1987 and 1991 DHS but as 'other private' sources in 1994, 1997, 2003 and 2007 DHS. A similar classification was used in this study with these facilities being classified as 'public' sources in 1987 and 1991 survey data and as 'NGO and other' sources for all other surveys.

classified as women in need.[2] Note that the indicator of need does not consider whether the woman is using a contraceptive method, which makes our definition different than that used in the DHS.

In order to assess variation in the use of modern contraception by socioeconomic status, a composite measure of household wealth was generated based on questions on household assets and living conditions using principal components analysis, which was then used to rank and assign households to wealth quintiles, along the lines suggested by Filmer and Pritchett [6].

Methodology

To quantify socioeconomic inequality in modern contraceptive use in the analysis, a concentration index (CI) was calculated for each survey round. The values of the CI can range from -1.0 to +1.0, with 0 indicating no inequality, a negative value indicating increased concentration of modern contraceptive use among the poor, and a positive value indicating increased concentration among the rich.

A potential problem with the CI approach above is that it does not consider differences in women's need for family planning services by socioeconomic status, and therefore limits the extent to which one can measure inequities in modern contraceptive use, as opposed to inequalities. In order to investigate horizontal inequity[3] in modern contraceptive use in each of the surveys, we standardized the measure of modern contraceptive use for family planning need in relation to household wealth. This was done using the indirect method of standardization, as suggested by the World Bank Institute [7], where need-standardized modern contraceptive use is

[2] The number of missing cases are, for the most part, very few. Every survey used but one had seven or fewer missing cases. The one survey used that has more than seven missing cases is the 1999 Nigeria DHS, which has 30 missing cases.

[3] Horizontal equity is defined as equal contraceptive use for women with equal need for contraceptives.

obtained by adding the overall sample mean of the indicator of modern contraceptive use to the difference between actual and need-predicted modern contraceptive use.

Estimates of need-predicted modern contraceptive use were computed using probit regression models. The dependent variable in the models is a dichotomous indicator measuring whether the woman is currently using a contraceptive method. Two types of independent variables were included in the models. The first type is composed of "need variables" measuring the need for modern contraception. Need variables in this study consisted of the dichotomous indicator of need described above, as well as the age and the educational attainment of the woman. The second type is composed of "non-need" variables, which are correlates of utilization of modern contraception that may bias the coefficients of the need variables if omitted from the models[4] [7]. The non-need variables are also non-confounding variables as they are theoretically related only to modern contraceptive use and not to family planning need. These variables consisted of a household wealth score, partner's educational attainment, woman's employment, and region (urban vs. rural) in this study. The results of the model were then used to estimate the woman's need-predicted probability of modern contraceptive use by setting the non-need variables at their means, and then generating predicted values.

Once need-expected and need-standardized use was obtained, we calculated their respective concentration indices. The method of indirect standardization "corrects" the actual distribution by comparing it with the distribution that would be observed if all women had not their levels of the non-need variables but the same mean values of the non-need variables as the entire population [7]. The CI of need-standardized contraceptive use provides a measure of horizontal equity.

[4] This provides partial correlation of the standardizing variable with the variable of interest conditional on the presence of the non-confounding variables.

A key assumption of this analysis is that once observable need indicators have been controlled, "any residual variation in utilization is attributable to non-need factors" [7]. This may be a strong assumption, given that the variables used to measure need were based on information on the desire for more children, age, and educational attainment. If there is unobserved variation in need correlated with wealth, then the procedure will result in biased measurement of horizontal inequity. Unfortunately, the modeling approach used in the study does not allow us to test this assumption with our data.

3. Results

Nigeria

The family planning program

The first explicit national population policy in Nigeria began during the military rule in 1988 with support from the World Bank [8]. Prior to that, the government had pursued an "implicit" population policy that was conducive to population growth, even though international pressure to address high rates of population growth had been gradually mounting. However, the government's attitude changed by the 1980s, due to the onset of a major economic crisis and the belief that lowering fertility rates was a necessary condition to achieving the government's development goals. The policy's specific objective was to help the citizens in regulating their family size voluntarily, with encouragement to not have more than four children, by provision and marketing of family planning services [9].

While this policy fell short of its targets (i.e., total fertility rate [TFR] of 3 and MCPR of 80 percent) [10], it still helped bring about a small positive change in the fertility situation, as indicated by the reduction of the TFR from 6.3 in 1981-82 to 5.2 in 1999 and an increase in the MCPR from 3.4 in 1990 to 8.6 in 1999 [9]. During this period, the government relied heavily on

external aid, whereby donors (mainly the U.S. Agency for International Development [USAID] and United Nations Population Fund [UNFPA]) remained the primary source of contraceptive supplies. But in 1993, when the results of presidential election were cancelled by the military regime, USAID withdrew its support as part of U.S. government sanctions [9]. UNFPA expanded its family planning operations in Nigeria to help fill the gap created by the withdrawal of USAID assistance, which helped save the family planning services provided by the public sector from collapse. This was also accompanied by the government taking on a larger role in supplying and distributing contraceptives beginning in 1995 [9]. The government's response to the withdrawal of this external assistance could be seen from the results of the 1999 DHS when the private sector as a source of contraceptive supplies shrank [9].

However, towards the end of the 1990s, flawed implementation of the policy along with economic unrest and prolonged political instability led to the collapse of the public health services [11, 12]. During this same time, with the advent of a democratic regime, the U.S. sanctions were lifted; but by that time family planning had taken a back seat to addressing HIV/AIDS and the wider agenda of reproductive health. President Olusegun Obasanjo started a campaign to combat HIV/AIDS with new strategies for the supply and distribution of condoms and mobilization of the private sector and NGOs [12]. Also, the Nigerian government adopted "reproductive health" in 2001 as a goal in its policy agenda, where there was increased focus on emergency contraception and long-term contraception with a goal to increase community participation and promote the private sector [11, 12]. The social marketing of contraceptives, which was led by the Society for Family Health, took on an important role in the family planning program [13]. As a result, the private sector replaced the public sector as the leading source of contraceptives (results shown below).

According to the government, wider recognition of problems such as HIV/AIDS, poverty, and gender inequality led to a revision of the population policy in 2005, which was renamed as the National Policy on Population for Sustainable Development [14]. However, with this policy revision, the family planning scenario has only recovered lost ground, with only a slight increase in the public and private sectors as sources of contraception.

Findings

Figure 1 shows modern contraceptive prevalence rates for Nigeria, as well as share of women currently using modern contraceptives who received their supplies from the private commercial sector, during 1999, 2003, and 2008. Notice that the percent of women who report currently using modern contraceptive methods declined, from 8.6 percent in 1999 to 8.1 percent in 2008, while the private commercial sector share increased from 34.6 percent to 58.4 percent over the same period. The share of contraceptive users who received supplies from the other two types of sources, the public sector and "others", decreased during this period.

Figure 1. Current use of modern contraceptive methods, by source of supplies and by year- Nigeria

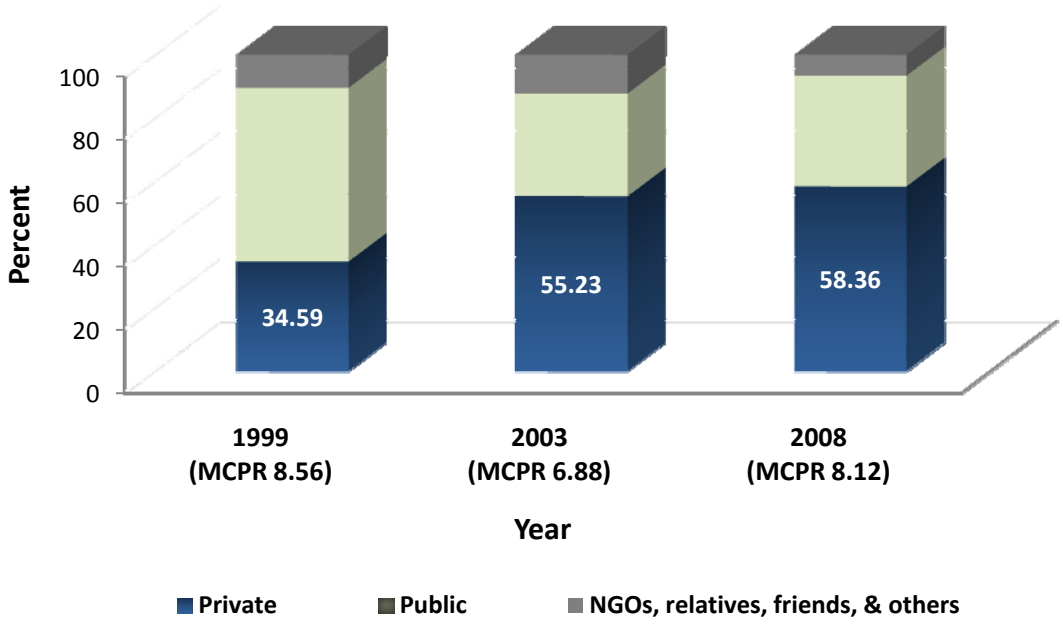
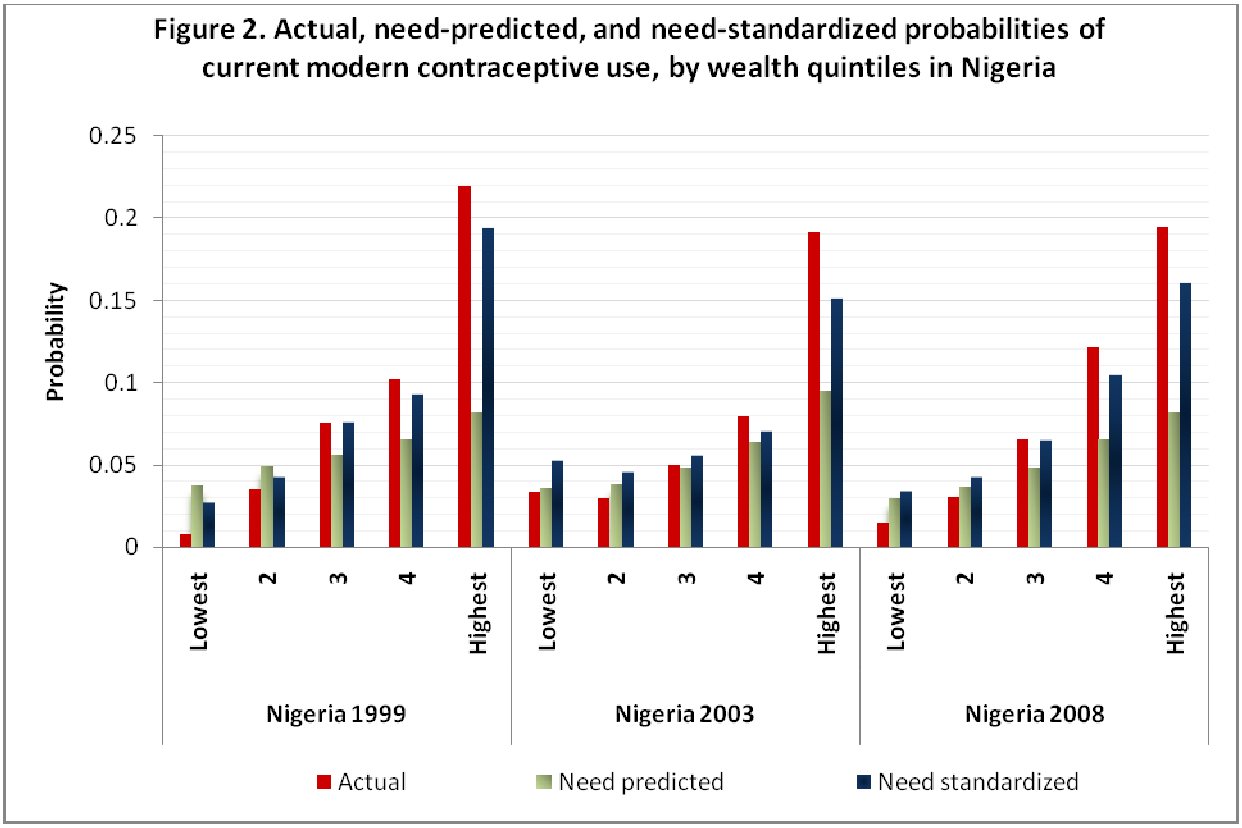


Figure 2 shows the proportion of women who report currently using modern contraceptive methods at the time of the survey by wealth quintile. For each of the three survey years – 1999, 2003, and 2008 – the results indicate that women in richer households were considerably more likely to use modern methods than women in poorer households. In other words, the distribution in each of the three surveys analyzed was pro-rich. The crude CI measuring MCPR inequality was 0.49 in 1999, fell to 0.43 in 2003, and then rose to 0.51 in 2008 (Figure 3).



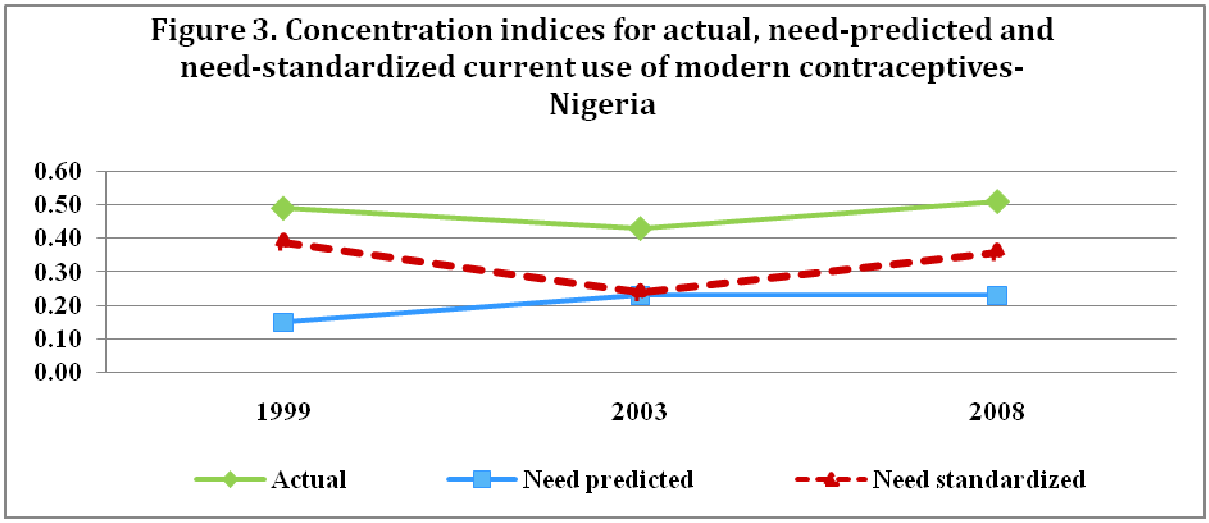


Figure 2 also shows the need-predicted and need-standardized probabilities of modern contraceptive use. As can be seen, the need-predicted probabilities of contraceptive method use were also positively associated with wealth in each of the survey years. This indicates that "need," as proxied by the indicators of need, age, and educational attainment, was more concentrated in the wealthier groups. As a result, for women in the poorest quintile, the probability of using modern contraception is lower than expected, given their need in each of the survey years, whereas women in the richest wealth quintile had a probability of modern contraceptive use that is higher than expected.

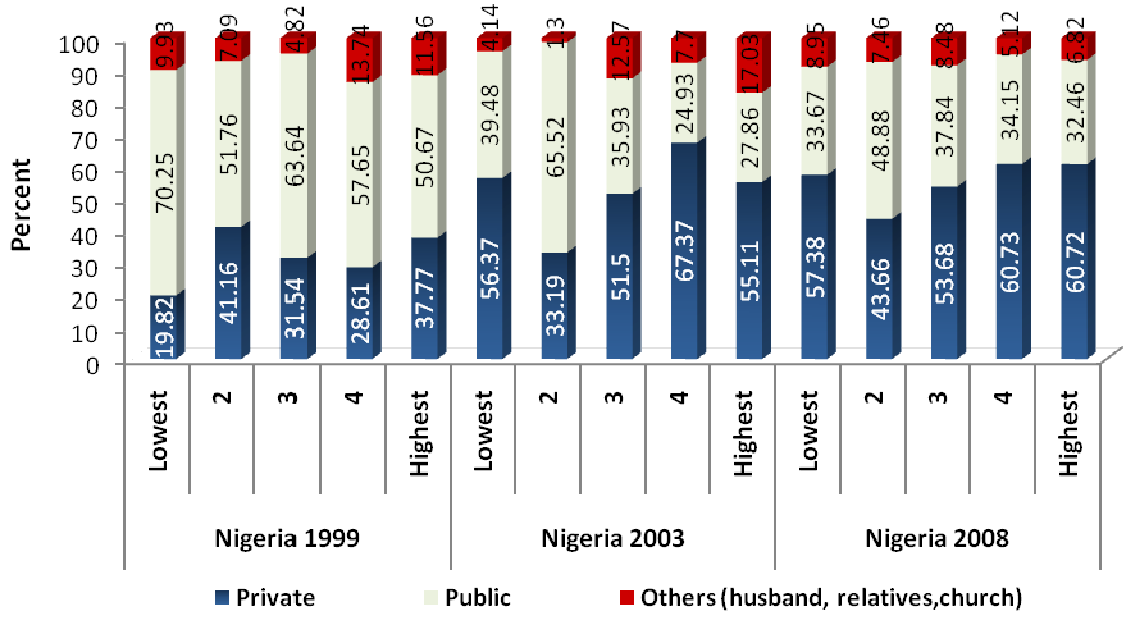
However, the degree of inequality in need-predicted use was much lower than the degree of inequality in actual use, as indicated in Figure 3. As a result, the need-standardized distribution, which is used to measure MCPR inequity as opposed to MCPR inequality, shows a lower pro-rich distribution than the actual distribution. This is indicted by the CI for the need-standardized distribution being lower than that of the actual distribution in each of the three survey years. For example, in 1999, the CI for the need-standardized distribution was 0.39, compared to the CI of 0.49 for the actual distribution (please see Table A3 in the appendix for 95 percent confidence intervals for each of the concentration indices estimated in the study). It

should be noted that, in each of the three survey years, MCPR inequity was relatively high while the MCPR among poor women was quite low.

As the private sector's provision of contraceptives increased from 1999 to 2008, MCPR inequity, as measured by the need-standardized distribution, decreased slightly from 1999 to 2003 (CI = 0.24 in 2003), and then increased from 2003 to 2008 (CI = 0.36 in 2008). The decline in MCPR inequity from 1999 to 2003 was driven both by an increase in utilization of contraceptives by women in the poorest quintile as well as by a small reduction in the use of contraceptives among women in the top two quintiles. The increase in MCPR inequity from 2003 to 2008 was primary due to lower current contraceptive use among women in the poorest wealth quintile. For the other four wealth quintiles, there were only small increases in contraceptive use.

Figure 4 shows a percent distribution of women currently using modern contraceptive methods by the source of the method. Notice that the share of women who report the private commercial sector as the source of their supplies increased from 1999 to 2008 not only for women in the richer wealth quintiles, but also for women in the poorer quintiles. In fact, for women in the poorest wealth quintile, the private commercial sector became the leading source of supplies by 2003 (56 percent in 2003 and 57 percent in 2008).

Figure 4. Percent distribution of women who currently use modern contraceptives, by source of method and by wealth quintile in Nigeria



Uganda

The family planning program

Uganda, a sub-Saharan country that has experienced intense civil and political unrest since its independence in 1962, adopted its first national population policy in 1995. Up until that time, the government provided only limited support to family planning efforts, with official government policy stipulating that only married women accompanied by their husbands or with written consent from their husbands were to be permitted to use contraception [15]. The country relied mainly on NGOs, especially the Family Planning Association of Uganda, for the provision of family planning services and supplies. NGO outlets tended to be more urban-based, which meant that women living in rural areas had limited accessibility to contraceptives [15].

Uganda's 1995 population policy was in line with the 1994 International Conference on Population and Development's plan of action for promoting reproductive health and making available family planning services in all government clinics [16]. Despite the change in policy,

family planning services and information, education, and communication activities received relatively low priority [15]. A more favorable environment for FP was created as a result of the HIV/AIDS epidemic and government's response to it, due to support for family planning from USAID and other international donors, as well as such policies as the Universal Primary Education Policy in 1997; the Local Government Act in 1997; and the National Health Policy in 1999. An important part of the family planning program since 1994 has been the social marketing of oral and injectable contraceptives, as well as the promotion and marketing of condoms [17], all of which are distributed through the private commercial sector.

Findings

Figure 5 shows the MCPR among currently married Ugandan women over time. As can be seen, the MCPR was 2.5 percent in 1988, and since risen since adoption of the country's 1995 population policy has risen to 14.0 percent in 2001 and 17.8 percent in 2006. The private commercial sector share has steadily increased from 10.1 percent in 1988 to 55.1 percent in 2006.

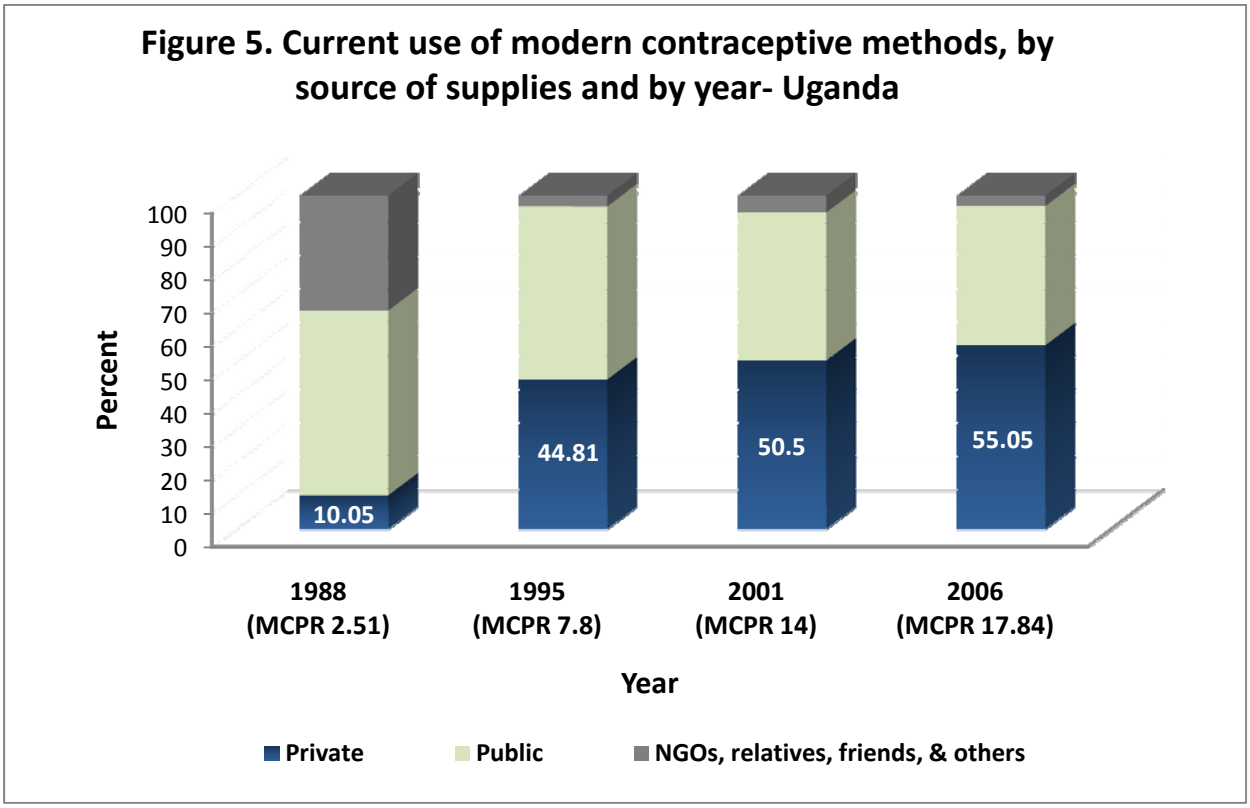
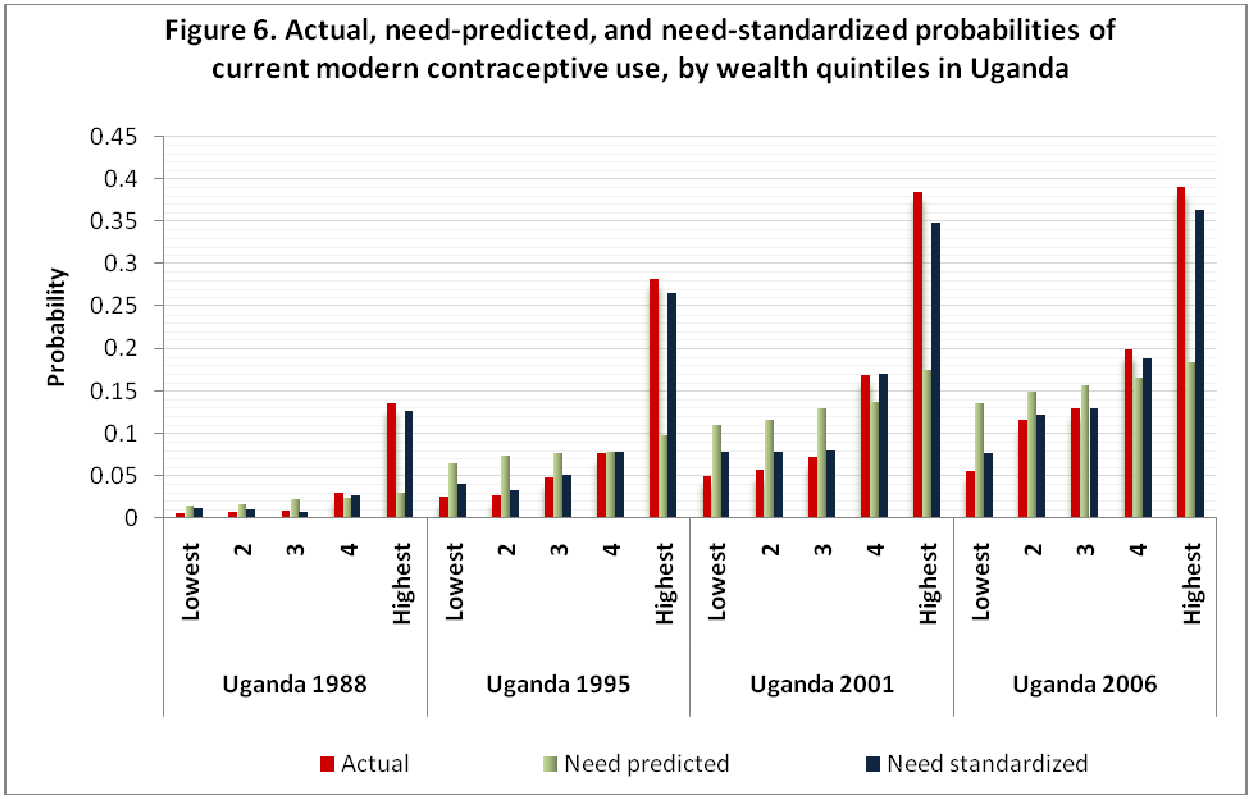


Figure 6 presents modern contraceptive use by wealth groups in Uganda over time. Notice that, in each survey year, women in wealthier households are more likely to currently use contraception than women in poorer households. However, women in all wealth groups experienced increases in contraceptive use, while the degree of MCPR inequality, as measured by the CI, declined substantially over time, from 0.54 in 1988 to 0.35 in 2006 (see Figure 7). The decline in inequality was a result of a substantial increase in contraceptive use among women in the bottom two wealth quintiles over the period. As in the case of Nigeria, the need-expected probability of modern contraception use was positively associated with household wealth in Uganda. Also, like Nigeria, women in the poorest wealth quintile had a probability of modern contraceptive use that was lower than expected, while women in the richest wealth quintile had a probability that was higher than expected. Because the degree of need-expected distribution was less pro-rich than the actual distribution, the CI for the need-standardized distribution was lower than the CI for the actual distribution for each of the survey years (Figure

7). Moreover, the degree of MCPR inequity declined over the 1989-2006 study period, as indicated by the CI for the need-standardized distribution declining from 0.45 in 1989 to 0.30 in 2006.



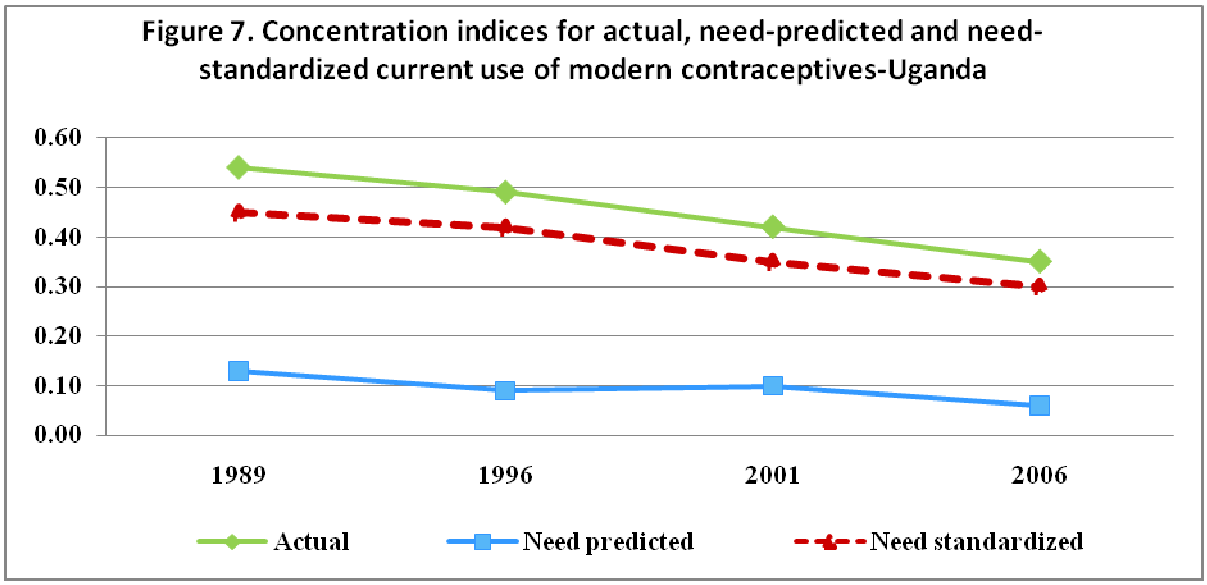
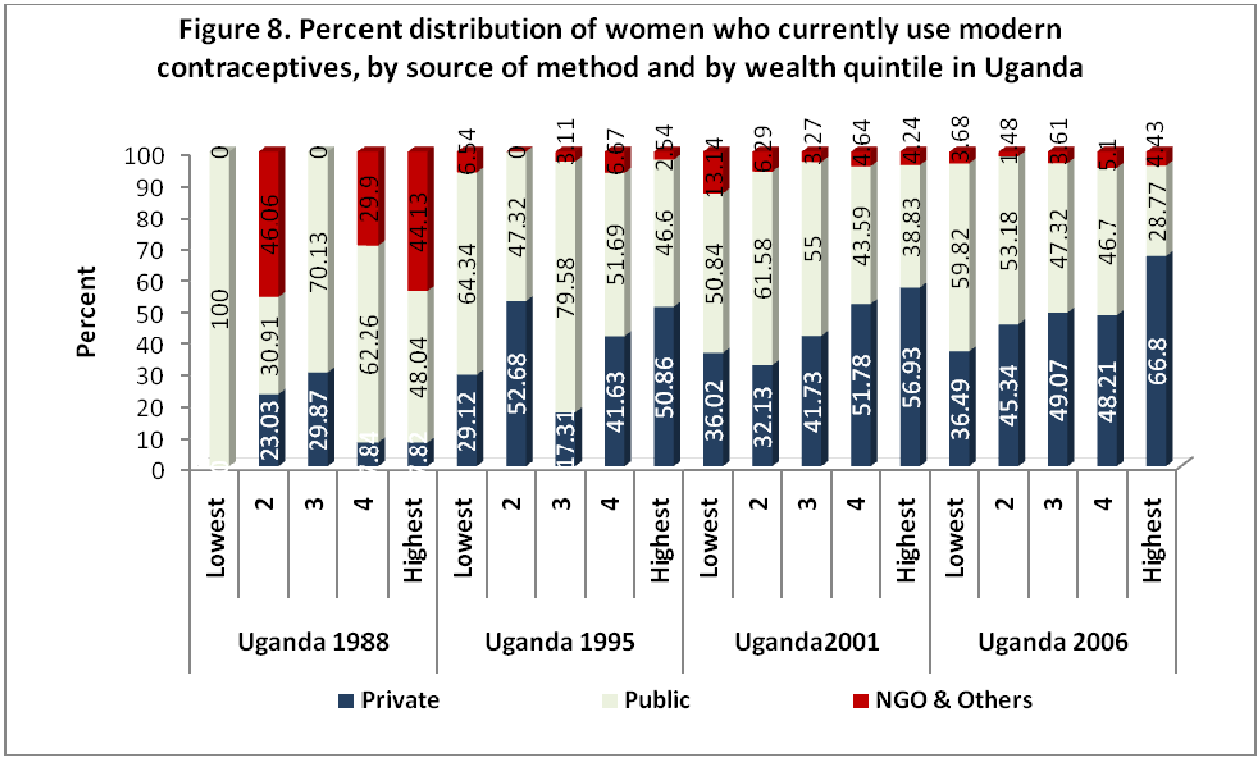


Figure 8 shows a percent distribution of Ugandan women currently using modern contraceptive methods by the source of the method. Notice from the figure that the increase in modern contraceptive use among women in all five of the wealth groups was associated with an expansion of the private commercial sector in the provision of contraceptive supplies. For example, in 1988, women in the poorest quintile relied exclusively on the public sector for their supplies. By the time of the last survey in 2006, the public share had dropped to 59.8 percent while the private commercial share had increased to 36.5 percent.



The results for Uganda, which indicate that MCPR inequity declined during a time when the private commercial sector share expanded, are consistent with previous studies that suggest that the private and informal sectors are playing a growing role in the provision of family planning services. For example, socially marketed methods became increasingly available in

Uganda and the availability of private commercial sector outlets was found to have a significant influence on the likelihood of using modern contraceptive methods [17].

Bangladesh

The family planning program

Bangladesh's first official population policy was formulated in 1976 when population growth was identified as a critical problem for the country [18]. Since independence in 1971, the evolution of Bangladesh's population policy has shown two distinct phases. Throughout the first phase, up until 1996, the objectives and strategies of the government's policy were reflected in the first four five-year plans that called for a target-driven approach with a maternal and child health (MCH)-based service delivery system [19]. The thrust was on increasing modern contraceptive usage among married women through a doorstep delivery service and a motivational campaign [20]. This was done through community-based local family welfare assistants (FWAs), a social marketing program of pills and condoms, and involvement of NGOs [21].

The second phase, starting in 1997, was strongly influenced by the 1994 International Conference on Population and Development, with several policy decisions shifting from a target-driven to a client-centered approach [22]. The fifth five-year plan, from 1997-2002, emphasized reproductive health with involvement of mass media, NGOs, and the private sector. The Health and Population Sector Program (HPSP: 1998-2003), using a sector-wide approach, integrated health and family planning into a Essential Services Package (ESP) at one-stop clinics, thereby moving the provision of services away from the home [19, 23]. The Health Nutrition and Population Sector Programme (HNPSP) was begun in July 2003 in an attempt to reform the health and population sector [24]. The National Population Policy was drafted in 2004 to

synergize the different sectors (public, private, civil society, and NGOs) and coordinate the efforts of different ministries in overcoming multi-sectoral problems related to population growth [18]. This policy targeted a wider segment of the population through decentralization, community involvement, and encouragement of participation from NGOs and the private sector, with special focus on adolescent issues and female empowerment [18][25]. The Social Marketing Company sold donated oral contraceptives and condoms at prices lower than the bulk market costs, resulting in an increased reliance over time in Bangladesh on socially marketed contraceptives after doorstep delivery was phased out.

Findings

Figure 9 shows the MCPR for Bangladesh as well as the share of women who used the private commercial sector for their source of supplies from 1994 to 2007. As can be seen, the MCPR has increased over time, from 36.6 percent in 1994 to 47.5 percent in 2007, although there was almost no change from 2004 to 2007. Moreover, during the 1994 to 2007 period, the share of contraceptive users who report receiving their supplies from the private commercial sector steadily increased from 15.5 percent to 43.4 percent. Over this same period, the share of women using the public sector fluctuated, increasing from 37.6 percent in 1994 to 64.5 percent in 1999-2000, and then decreasing to 49.8 percent in 2007, and the share of women using NGOs and other sources have dropped from almost 50 percent in 1994 to just 6.8 percent in 2007.

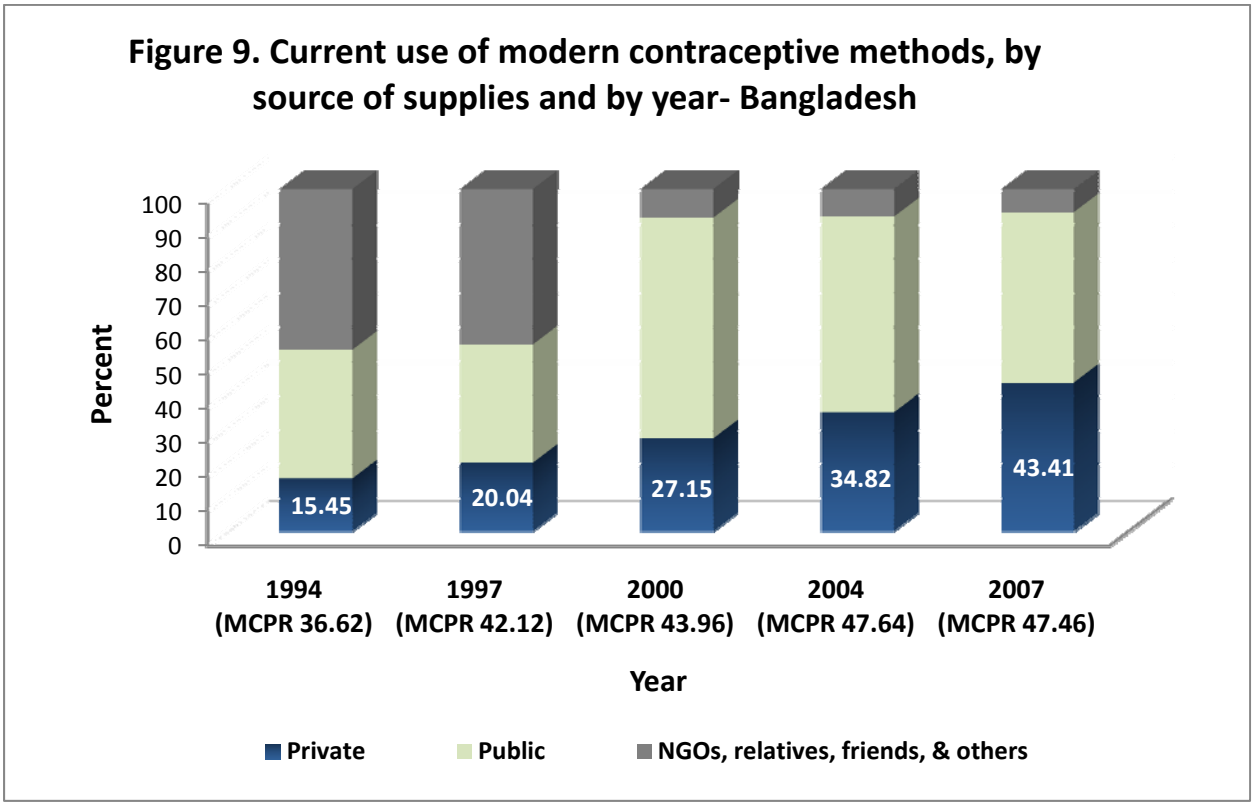


Figure 10 presents modern contraceptive use by wealth quintile in Bangladesh over time. Notice from the figure that the distribution of actual use across the wealth quintiles is relatively uniform, which is unlike the cases of Nigeria and Uganda. This suggests that MCPR inequality was quite low in each of the survey years analyzed. In 1993-94, the CI was only 0.04 and has actually decreased over time to 0.01 in 2007 (Figure 11).

For each of the survey years, the need-expected probability of modern contraceptive use among currently married women was also relatively uniform across the five wealth groups. As a result, the need-standardized probabilities are very similar to the actual probabilities, as indicated in Figure 11. Overall, the level of MCPR inequity, based on the need-standardized distribution, remained relatively constant during the 1994-2007 study period.

Figure 10. Actual, need-predicted, and need-standardized probabilities of current modern contraceptive use, by wealth quintiles in Bangladesh

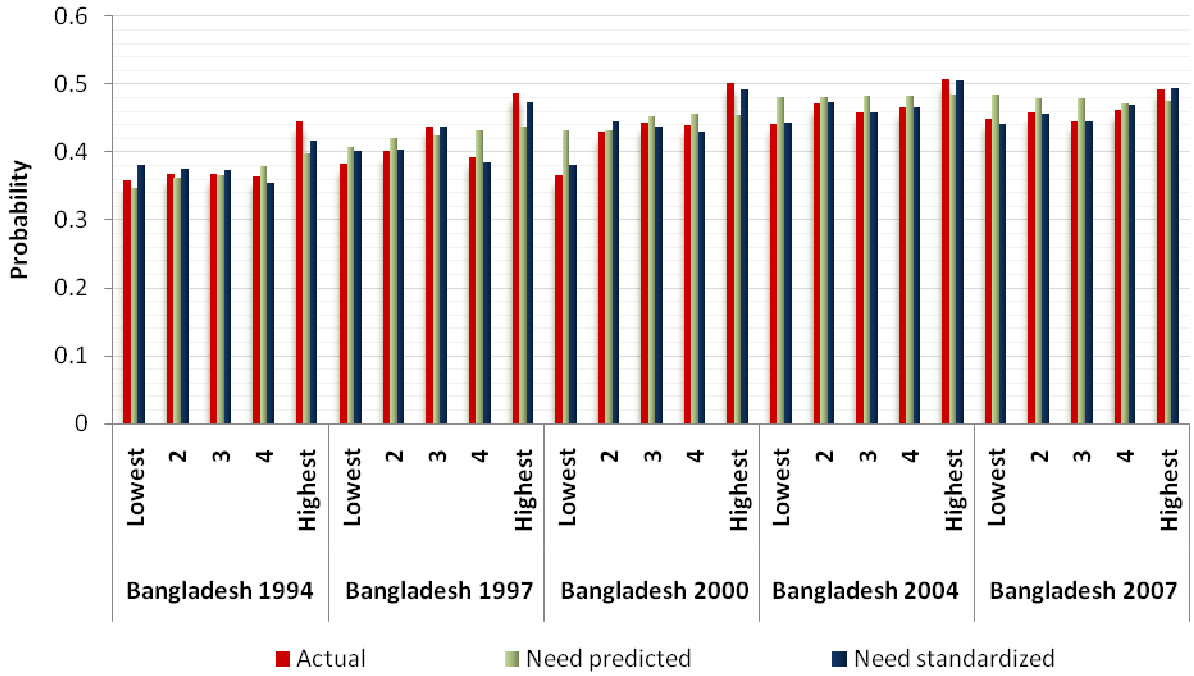


Figure 11. Concentration indices for actual, need-predicted and need-standardized current use of modern contraceptives-Bangladesh

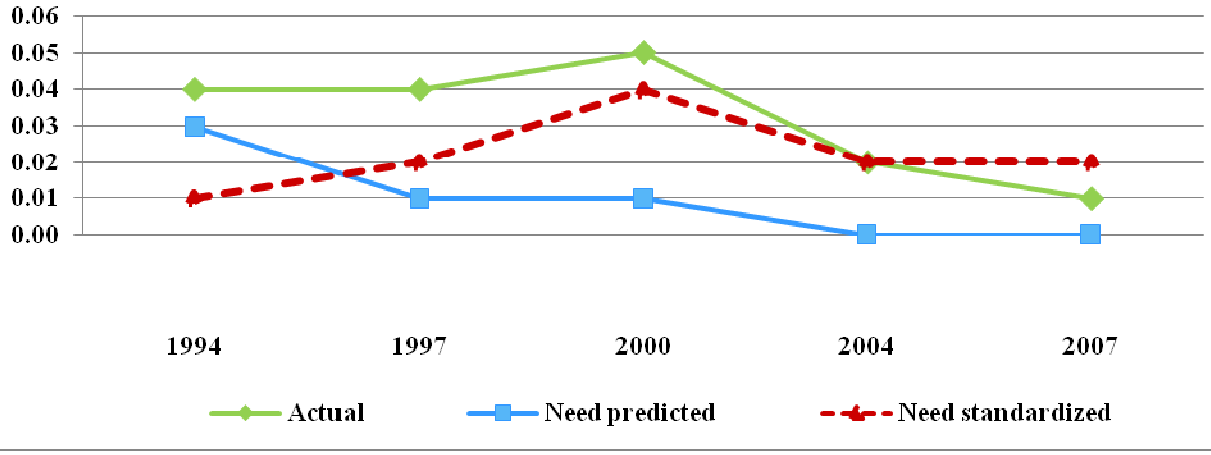
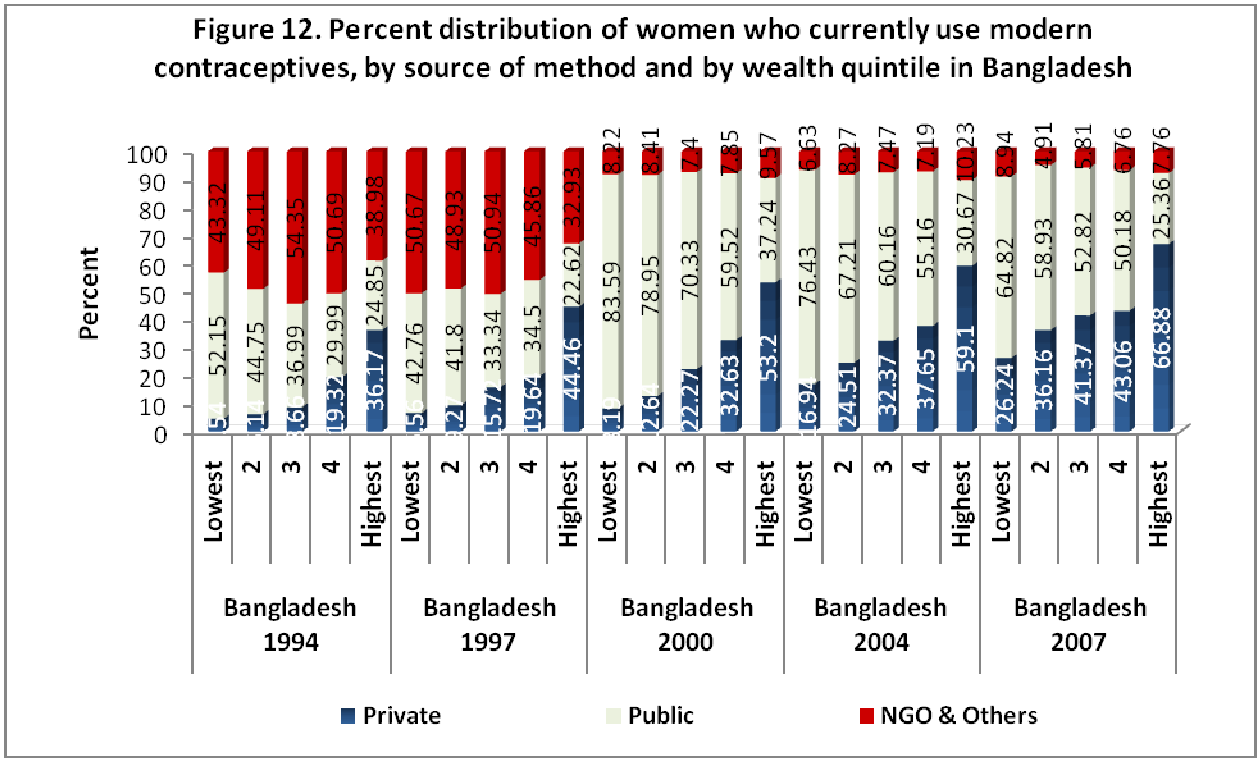


Figure 12 shows a percent distribution of women currently using modern contraceptive methods by the source of the method. The increase in the share of women who used the private commercial sector for their source of supplies from 1994 to 2007 occurred in each of the wealth

quintiles. By the time of the last survey in 2007, the private commercial sector was the source of supplies for more than one-fourth of women in the poorest quintile and two-thirds of women in the richest quintile. Note that while the private share increased among all wealth quintiles, the public share remained high among women in each of the quintiles except the richest one. Thus, in 2007, when the ratio of the private commercial share vs. the public share was 67:25 among the richest group of women, it was the opposite of 26:65 among the poorest group of women. This is in line with the conclusions of Agha and Do [3] who found that an increase in private sector supply frees the public sector to better target the poor.



Overall, the results of the Bangladesh analysis suggest that the growth of the private commercial sector over the study period has not led to increased MCPR inequity, as based on the need-standardized distribution of modern contraceptive use. By the time of the first survey in

1993-94, MCRP inequity was already very low in Bangladesh, with women relying primarily on the public sector, NGOs and other sources for their contraceptive supplies. As the doorstep policy was phased out, private commercial outlets, including those that offered socially marketed supplies, took on a greater role in the family planning program, but not at the expense of increased MCPR inequity.

Indonesia

The family planning program

The initial effort to expand family planning services in Indonesia evolved from a private endeavor in 1950s through the formation of the National Family Planning Board (PKBI). The board focused its efforts on information dissemination in clinics [3, 26]. However, with the transition to a new administration in 1966, actual government involvement began with the formation of the National Family Planning Coordinating Board (BKKBN) in 1970 with the adoption of a vision of a "happy and small family" norm. Though the Indonesian family planning program started relatively late, its successful implementation brought about a significant change in reproductive behavior, and helped reduce the total fertility rate from the 1972 level of 5.5 children per woman to 3.3 children per woman by the late 1980s [27]. The program's coverage spread in a phased manner between 1969-1983, starting with densely populated urban areas of Java and Bali using a clinic delivery model, followed by the expansion to rural areas using an integrated community-based model, and then later the inclusion of the country's outer islands using a self-sufficient decentralized family planning model [3, 26]. The program's success has been credited to its dynamic leadership, and strong political, religious and financial support [27].

Due to a multitude of factors, BKKBN adopted a policy that aimed to increase the role of the private sector, leading to launch of a nationwide program, called KB Mandiri, in 1987. This led to the introduction of user fees in public outlets; the creation of a new cadre of FP service providers under the Blue Circle Service Provider Initiative; the introduction of a range of high quality yet affordable contraceptives through the Blue Circle social marketing campaign, which were sold at reduced but commercially sustainable prices; and the promotion of both providers and products through a communication campaign and public relations reinforcing the message of self reliance [26].

By the mid-1990s, BKKBN incorporated into its strategy a reproductive rights approach, with efforts made to improve: the provision of comprehensible family planning information, client empowerment, service quality, and the role of the private sector. This was facilitated by new government laws and decrees related to population development [28]. All this led to a shift towards the private sector for the provision of contraception supplies and services and a firm establishment of the small family norm [29].

In the late 1990s, the 1997 Asian economic crisis severely crippled Indonesia. The public sector's investment in FP program dropped and the quality of services offered by the public sector deteriorated. However, the private sector stepped in to fill the gap, and as a result, MCPR levels did not decline [29].

After President Suharto resigned in 1998, family planning activities received lower priority from the new administration [30]. BKKBN lost its authority, funding, and political support, resulting in a significant reduction in number of family planning offices/centers and family planning counselors [31]. As opposed to the mid-1990s, when increased private sector service provision was the result of a deliberate strategy, the increasing role taken on by the private sector in the late 1990s was the result of a failing public sector.

Findings

Figure 13 shows the MCPR for Indonesian women and the share of users who received their supplies from the private commercial sector over time. As can be seen, the MCPR has increased from 43.9 percent in 1987 to 57.3 percent in 2007. During this same period, contraceptive users increased their reliance on the private commercial sector for their supplies, and decreased their reliance on the public sector. The private commercial sector market share increased from 12.3 percent in 1987 to 70.7 percent in 2007, while the public sector market share decreased from 80.3 percent to 23.1 percent.

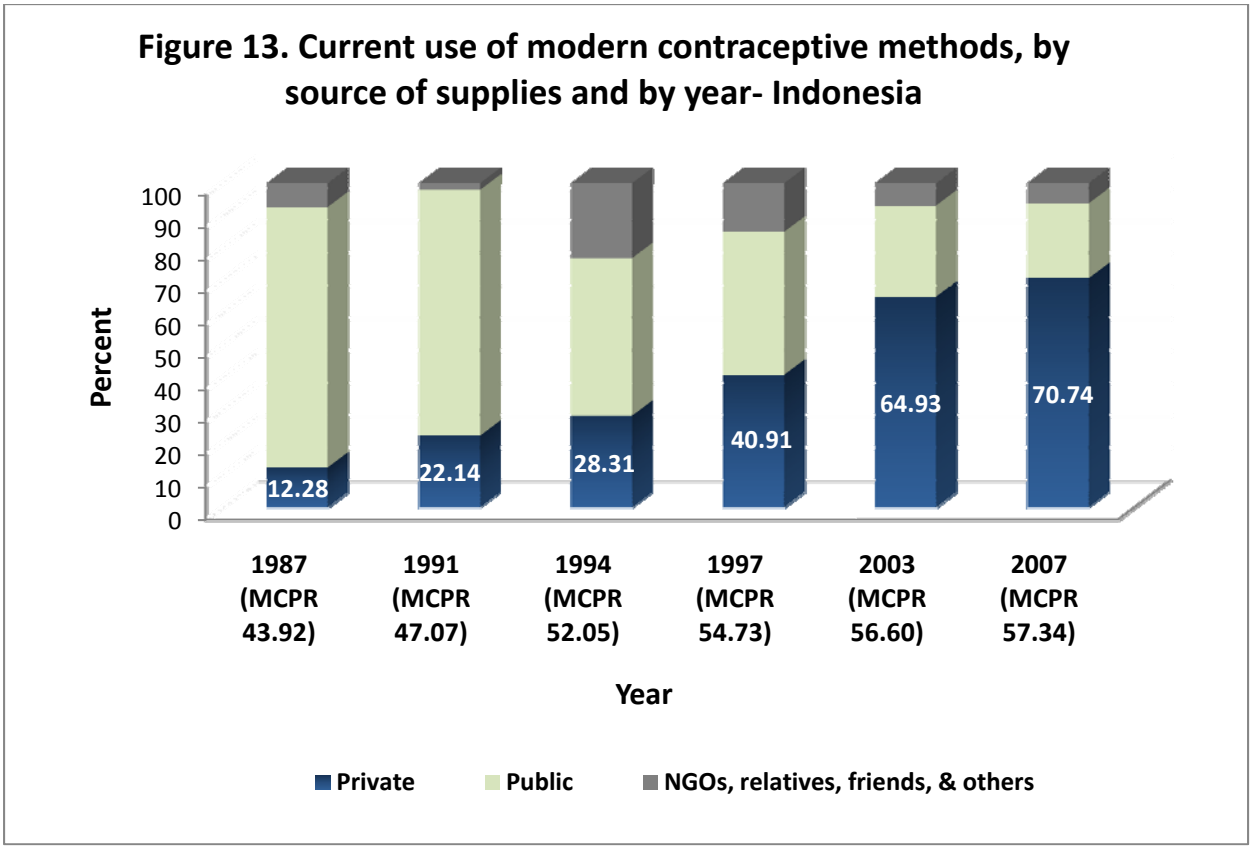
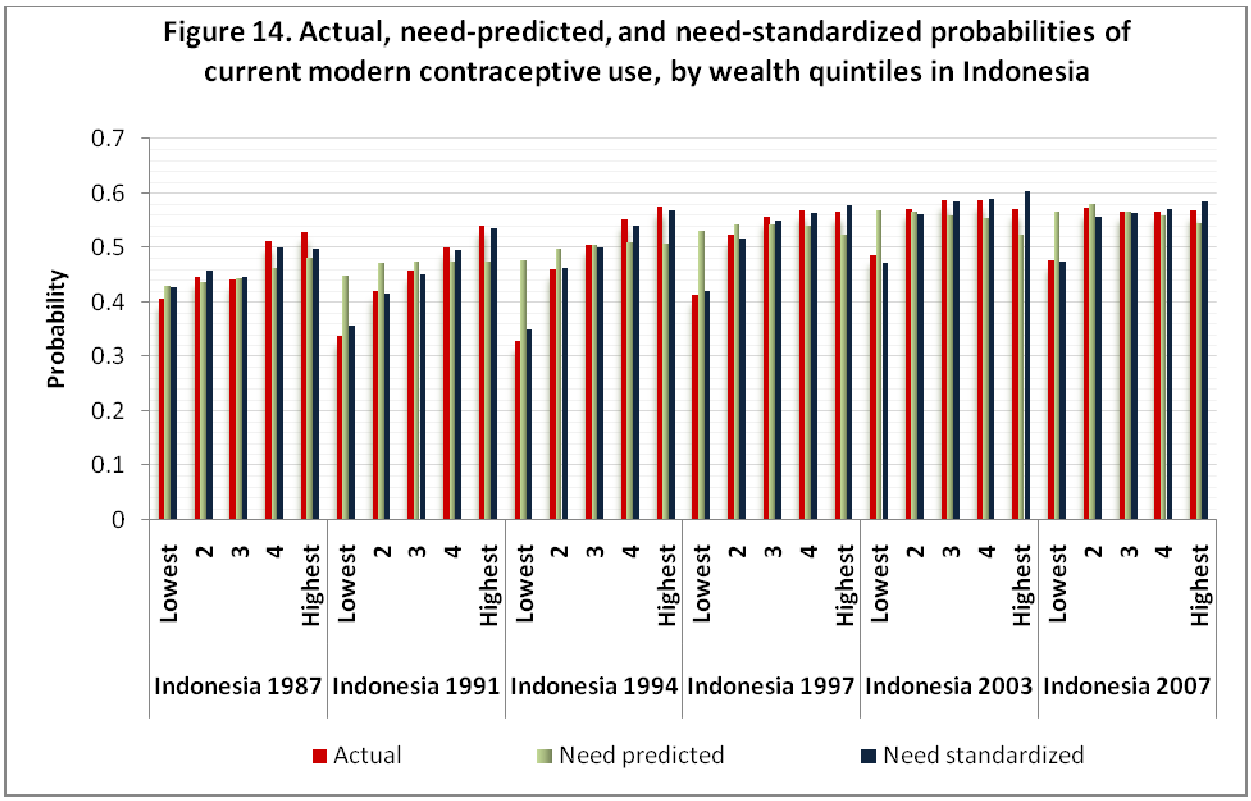


Figure 14 presents modern contraceptive use by wealth quintile in Indonesia over time. In each survey year, from 1987 to 2007, there was little difference in contraceptive use between the rich and the poor – in other words, the better off groups of Indonesian women were only

slightly more likely to use a modern contraceptive method than the poor. Like Bangladesh, the degree of MCPR inequality was quite low over the study period and has even decreased over time (from CI = 0.07 in 1987 to CI = 0.02 in 2007) (Figure 15). Moreover, by 2007, the MCPR for women in each of the top four quintiles was relatively similar – about 57 percent for each group – while the MCPR for women in the poorest wealth quintile was much lower (47.7 percent). Again, like Bangladesh, the need-expected probabilities were relatively uniform across the wealth quintiles, which explains why the actual and need-standardized probabilities are quite similar. Moreover, as indicated in Figure 15, the degree of MCPR inequity, based on the need-standardized distribution, dropped slightly over time, from 0.05 in 1987 to 0.03 in 2007, during a time when the private commercial share grew.



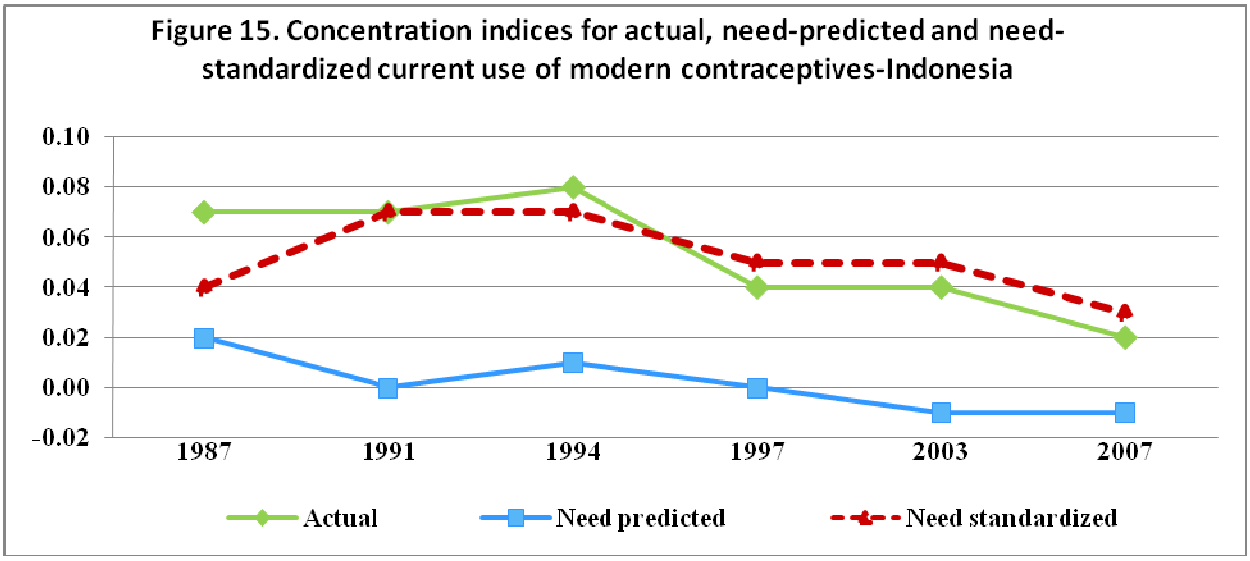
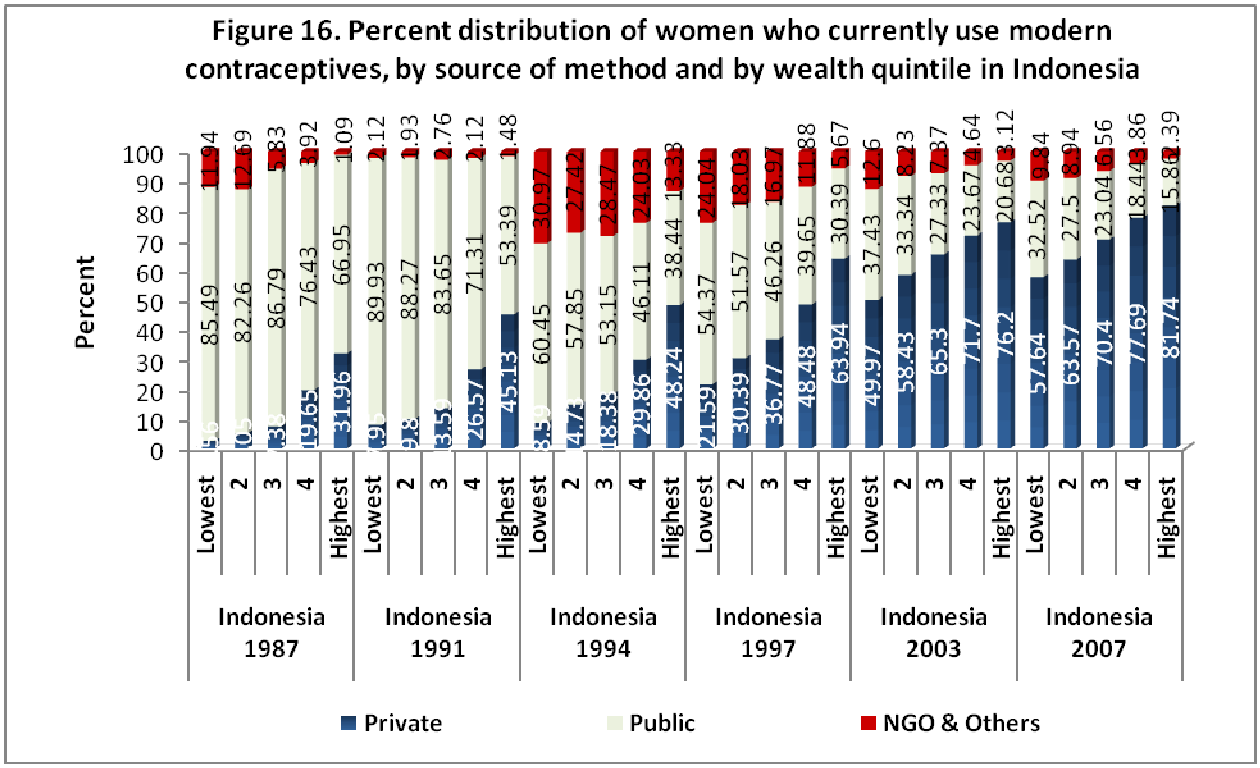


Figure 16 presents a percent distribution of the women who were currently using modern contraception methods by the source of supply over time. As can be seen, women in every wealth group became increasing reliant on the private commercial sector over time. Moreover, by the time of the 2003 survey, the majority of contraceptive users in each group, including the poorest, reported obtaining their supplies from private commercial outlets.



The results suggest that the change in the public-private mix in the provision of family planning supplies over the 20-year period did not come at the expense of increased MCPR inequity. The more predominant role of the private sector is likely to have resulted in part from an explicit policy strategy during much of the 1980s and 1990s. However, following the political and economic crises in the late 1990s, the further increase in the private commercial market share may have also resulted from the government placing lower priority on the public provision of family planning services.

4. Discussion

The purpose of this study is to investigate the question of whether the expansion of the private commercial sector in the provision of contraceptive supplies leads to MCPR inequity. By facilitating the expansion of the role of the private sector in the supply of contraceptives,

governments can potentially better target those women who are in need of family planning services, but lack the ability and willingness to pay. This can improve the likelihood that family planning programs will be financially sustainable, and help withstand fluctuations in donor assistance earmarked for family planning services. On the other hand, one could argue that if countries increasingly rely on the private sector without appropriate adjustment of the targeting of services to the poor and other vulnerable groups, the availability of contraceptives to those groups could potentially deteriorate, and as a result, lead to MCPR inequality (and inequity). Because the relationship between increased private market share and MCPR inequity is not obvious, empirical evidence on this issue is needed by reproductive health policy makers in low- and middle-income countries who are responsible for improving contraceptive security.

Overall, the results of the study suggest that the expansion of the private commercial sector supply of contraceptives in the two African study countries (Nigeria and Uganda) and the two Asian study countries (Bangladesh and Indonesia) did not lead to increased MCPR inequity. In fact, in three of the four study countries (Nigeria, Uganda, and Indonesia), MCPR inequity actually decreased over time, while in the fourth study country (Bangladesh), MCPR inequity fluctuated. Overall, the results offer support to the premise that government strategies that promote the role of the private commercial sector can help facilitate the achievement of equity objectives.

There are a number of important contextual differences between the four study countries that make it difficult to make definitive policy recommendations based on the results of the study.

First, in some of the countries, the expansion of the private commercial sector was sometimes but not always part of an explicit government strategy. For example, the increased reliance of women on the private commercial sector for their contraceptive supplies was in part

due to political and economic instability (i.e., Nigeria during the 1990s, Indonesia during the late 1990's and early 2000's, where the public sector's role diminished significantly) and in part due to family planning receiving lower priority in the population and health sectors (i.e., Nigeria during the 1990s, Uganda during 1990s, and Indonesia during the 2000s). This indicates that the private commercial sector helped fill a void that resulted from these macro-level forces. On the other hand, in Bangladesh, the expansion of the private sector seemed to be part of a deliberate policy strategy that shifted from a target-driven approach to a facility-based approach.

Second, the role of socially marketed contraceptives, which are included in our definition of the private commercial sector, may have also varied across the study countries. While social marketing played an important role in the family planning program in all four of the study countries, we do not have information on the degree to which the social marketing programs received price subsidies as well as the reach of the programs.

Third, while countries that increasingly relied on the private commercial sector for their family planning supplies should have had a greater ability to target poor women, the study results suggest that poor women's reliance on the public sector for their supplies did not increase over time. On the contrary, in each of the four study countries, women in the poorest wealth quintile increased their reliance on the private commercial sector while achieving higher rates of modern contraceptive use over time.[5] These results imply that the private commercial sector can play an important role in improving the availability and use of family planning supplies not only among better off women, but among poorer women as well.

[5] In Bangladesh, the public sector share among the poorest fluctuated a bit but increased from 1994 to 2007. This is the only country where the public sector remains the main supplier for the poor while the private sector is increasingly the main provider for the rich.

In exploring the relationship between the expansion of the private commercial sector and MCPR inequity, a contribution of the study is that we control for the need for family planning services, which could potentially vary by socio-economic status and as a result, lead to differences between MCPR inequality, which is based on actual use, and MCPR inequity, which is based on need-standardized use. We controlled for need by deriving need-expected probabilities of using modern contraceptives, which were then used to calculate need-standardized concentration indices. An important finding in the study is that there are often substantial differences between the actual and need-standardized probabilities of modern contraceptive use. As a result, the degree of MCPR inequity was sometimes very different the degree of MCPR inequality. This was particularly true in the two African countries included in our study.

There are a number of limitations to the study. One important limitation is that we do not attempt to empirically attribute differences in MCPR inequity over time to differences in the private commercial supply. The family planning supply environment is one of many factors that can influence a woman's choice of provider, along with other community-level factors and household- and individual-level factors. We do not test the hypothesis that an increase in the private commercial sector supply of contraceptives leads to MCPR inequity. Other limitations of the study include the relatively small number of women currently using contraception in Nigeria and Uganda, which may make it difficult to interpret changes over time, and the inclusion of socially marketed product provision in our definition of the private sector, which may have resulted in an overestimate of the size of the private commercial sector and, as a result, an underestimate of the true association between the private commercial sector's share of contraceptive supply and inequity.

In conclusion, our findings that the expansion of the private commercial sector did not lead to increased MCPR inequity in the four study countries are consistent with the conclusions of Agha and Do [3]. While the public sector remains an important source of supply for poor women, who may lack the physical and financial accessibility to private outlets that sell modern contraceptives, our results also suggest that the private commercial sector can also be an important source of supply to women for poor women without leading to increased MCPR inequity. Social marketing programs are likely to have played an important role in expanding the use of private suppliers among poor women.

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Appendix Tables

Table A1: DHS Used in the Analysis

Country	DHS	Sample size (currently married or cohabitating women)
Nigeria	NGDHS 2008	23,954
	NGDHS 2003	5157
	NGDHS 1999	5755
Uganda	UGDHS 2006	5362
	UGDHS 2001	4675
	UGDHS 1995	4903
	UGDHS 1988	3055
Bangladesh	BDDHS 2007	10,146
	BDDHS 2004	10,417
	BDDHS 1999-00	9,530
	BDDHS 1996-97	8,306
	BDDHS 1993-94	8,846
Indonesia	IDDHS 2007	30,869
	IDDHS 2003	27,784
	IDDHS 1997	26,833
	IDDHS 1994	26,220
	IDDHS 1991	21,187
	IDDHS 1987	10,919

Table A2: Categorization of Source of Supply

Categorization of Source of Supply in Nigeria

	Public	**Private**	**Others**
Nigeria 2008	Public Govt Hospital	Private Hospital/Clinic	NGO
	Public Govt Health Center	Private Pharmacy	Other Source- Church
	Public Family Planning Clinic	Private Chemist/ Pms Store	Other Source Friend/Relative
	Public Mobile Clinic	Private Doctor	
	Public Fieldworker	Private Mobile Clinic	
	Other Public	Private Fieldworker	
		Other Private	
		Other Source Shop	
Nigeria 2003	Government Hospital	Private Hospital, Clinic	Church
	Government Health Center	Pharmacy/Patent Medicine Store	Friend/Relative
	Family Planning Clinic	Private Doctor	Other
	Community Health Worker	Community Health Worker	
	Other Public	Other Private Medical	
		Shop	
Nigeria 1999	Pub Gov Hosp	Pvt Hosp, Clinic	Church - (Other)
	Pub Gov Hlth Ctr	Pvt Pharmacy/Pat Med Store	Friends, Relatives (Other)
	Pub Fam Plan Clin	Pvt. Doctor	Non-Gvt Org (Other)
	Pub Mobile Clin	Pvt. Mobile Clin	Other
	Pub Community Hlth Wkr	Pvt Community Hlth Worker	
	Other Public	Other Private Medical	
		Shop - (Other)	
Nigeria 1990	Government Hospital	Private Hospital	Planned Parenthood F.
	Government Health C.	Private Health C.	Husband's Place Of Work
	Government Doctor	Private Doctor	Your Place Of Work
		Private Clinic	Friends, Relatives
		Pharmacy	Other
		Patent Medicine Shop	
		Market	

Categorization of Source of Supply in Uganda

	Public	**Private**	**Others**
UGDHS 2006	Government Hospital	Private Hospital / Clinic	NGO Community Based Distributor
	Government Health Center	Pharmacy / Drug Shop	Shop
	Family Planning Clinic	Private Doctor / Nurse / Midwife	Friends / Relative
	Outreach	Private Outreach	Other
	Government Community Based Distributor	Shop	
	Other Public		

UGDHS 2001	Government Hospital	Private Hospital, Clinic	NGO CBD
	Government Health Center	Pharmacy/Drug Shop	Religious Institution
	Family Planning Clinic	Private Doctor/Nurse/Midwife	Friend/Relative
	Outreach	Outreach	Other
	Government Cbd	Other Private Medical	
	Other Public	Shop	
UGDHS 1995	Government Hospital	Private Hosp, Clinic	Church
	Government Health C.	Pharmacy	Friends, Relatives
	Govt.Disp/Hlth Unit	Private Doctor	Other
	Govt.Mobile Clinic	Private Mobile Clin	
	Govt. Field Worker	Private Field Worker	
	Other Public	Other Private	
		Shop	
UGDHS 1988	Govt Hospital	Priv Doctor	Friends /Relatives
	Govt Health Center	Priv Hosp /Clinic	Trad Healer
	FPAU Clinic	Pharmacy /Shop	Other
	Mobile Clinic		
	Field Worker		

Categorization of Source of Supply in Bangladesh

	Public	**Private**	**Others**
Bangladesh 2007	Hospital/Medical College	Private Hospital/Clinic	Friends/Relatives
	Family Welfare Centre	Qualified Doctor	NGO Static Clinic
	Upazila Health Complex	Traditional Doctor	NGO Satellite Clinic
	Satellite Clinic/Epi Outreach (Mobile)	Pharmacy	NGO Depot Holder
	Maternal And Child Welfare	Other Private Medical	NGO Field Worker
	Govt Field Worker	Shop	Other NGO
	Community Clinic		Other
	Other Public		
Bangladesh 2004	Hospital/Medical College	Private Hospital/Clinic	Friend/Relatives
	Family Welfare Center	Qualified Doctor	NGO Static Clinic
	Thana Health Complex	Traditional Doctor	NGO Satellite Clinic
	Satellite Clinic/ Epi Outreach Site	Pharmacy	NGO Depot Holder
	Maternal And Child Welfare	Shop	NGO Fieldworker
	Government Field Worker		Other
	Community Clinic		
Bangladesh 1999-00	Hospital/Medical College	Private Hospital/Clinic	Friend/Relatives
	Family Welfare Centre	Qualified Doctor	NGO Static Clinic
	Thana Health Complex	Traditional Doctor	NGO Satellite Clinic
	Satellite Clinic/Epi Outreach Site	Pharmacy	NGO Depot Holder
	Maternal Child Welfare Center (MCWC)	Shop	NGO Fieldworker
	Govt. Field Worker (FWA)		Other

Bangladesh 1996-97	Hospital /Medical Col	Priv. Clinic /Doctor	Friends /Relatives
	Fam. Welfare Centre	Trad. Doctor	Fieldworker /FWA
	Thana Health Complex	Pharmacy	NGO Clinic
	Satellite /Epi Clinic	Shop	Other
Bangladesh 1993-94	Hospital /Medical Clg	Private Clinic,Doct.	Friends, Relatives
	Family Welfare Cent.	Traditional Doctor	Fieldworker, FWA
	Thana Health Complex	Pharmacy	Other
	Satellite Clinic	Shop	

Categorization of Source of Supply in Indonesia

	Public	**Private**	**Others**
Indonesia2007	Government Hospital	Private Hospital	Friends/Relatives
	Government Health Center	Private Clinic	Other
	Government Clinic	Private Doctor	Delivery Post
	FP Fieldworker	Private Midwife	Health Post
	FP Mobile Unit	Private Village Midwife	FP Post
	Other	Pharmacy/Drugstore	
		Other Private Medical	
		Shop	
Indonesia2003	Hospital	Hospital	Friends/Relatives
	Health Center	Clinic	Other
	Clinic	Doctor	Delivery Post
	FP Fieldworker	Nurse/Midwife	Health Post
	FP Mobile Unit	Village Midwife	FP Post
	Other	Pharmacy/Drug Store	
		Other	
		Shop	
Indonesia1997	Government Hospital	Private Hospital	Friends /Relatives
	Health Center-Pusk.	Private FP Clinic	Other
	Fieldworker-Plkb	Private Doctor	Health Officer (Mantri Kesehatan)
	FP Mobile-Tkbk /Tmk	Private Midwife	Deliv. Post /Polindes
	Other Government	Pharmacy, Drugstore	Health Post-Posyandu
	Safari Kb	Other Private	
	Village Official	Tradit. Healer-Dukun	
	FP Post /Ppkbd		
Indonesia1994	Government Hospital	Private Hospital	Friends /Relatives
	Health Center-Pusk.	Private FP Clinic	Other

	Fieldworker-Plkb	Private Doctor	Deliv. Post /Polindes
	FP Mobile-Tkbk /Tmk	Private Midwife	Health Post-Posyandu
	Other Government	Pharmacy, Drugstore	FP Post /Ppkbd
		Other Private	
		Tradit. Healer-Dukun	
Indonesia1991	Government Hospital	Private Hospital	Friends /Relatives
	Health Center-Pusk.	Private Clinic	Other
	Health Post-Posyandu	Private Doctor	
	FP Post /Vcdc/Paguyu.	Private Midwife	
	Fieldworker-Plkb	Pharmacy /Drugstore	
	FP Mobile-Tkbk /Tmk	Tradit. Healer-Dukun	
	FP Safari		
Indonesia1987	Klinik Kb	Apotik (Pharmacy)	Lainnya (Other)
	Plkb Petugas Lapang.	Dokter Swasta (Priv)	
	Pos Kb (FP Post)	Bidan (Midwife)	
	Tkbk (Mobile Unit)	Dukun (Trad. Healer)	
	Safari. (Campaign)		
	Posyandu (Hlth Post)		

Table A3: Estimates of Concentration Indices and 95% Confidence Intervals, by Survey

DHS Surveys	Type of Concentration Index	Concentration Index	(95% Confidence Interval)*
Nigeria 1999	Actual CI	0.49	(0.48 - 0.50)
	Need predicted CI	0.15	(0.15 - 0.16)
	Need standardized CI	0.39	(0.37 - 0.40)
Nigeria 2003	Actual CI	0.43	(0.42 - 0.44)
	Need predicted CI	0.23	(0.22 - 0.24)
	Need standardized CI	0.24	(0.21 - 0.28)
Nigeria 2008	Actual CI	0.51	(0.51 - 0.52)
	Need predicted CI	0.23	(0.23 - 0.23)
	Need standardized CI	0.36	(0.35 - 0.37)
Uganda 1988	Actual CI	0.54	(0.48 - 0.61)
	Need predicted CI	0.13	(0.11 - 0.14)
	Need standardized CI	0.45	(0.39 - 0.51)
Uganda 1995	Actual CI	0.49	(0.47 - 0.51)
	Need predicted CI	0.09	(0.08 - 0.09)
	Need standardized CI	0.42	(0.40 - 0.44)
Uganda 2001	Actual CI	0.42	(0.41 - 0.44)
	Need predicted CI	0.10	(0.10 - 0.10)
	Need standardized CI	0.35	(0.33 - 0.36)
Uganda 2006	Actual CI	0.35	(0.33 - 0 .37)
	Need predicted CI	0.06	(0.05 - 0.06)
	Need standardized CI	0.30	(0.28 - 0.32)
Bangladesh 1993-94	Actual CI	0.04	(0.03 - 0.05)
	Need predicted CI	0.03	(0.02 - 0.03)

	Need standardized CI	0.01	(0.00 - 0.02)
Bangladesh 1996-97	Actual CI	0.04	(0.03 - 0.04)
	Need predicted CI	0.01	(0.01 - 0.02)
	Need standardized CI	0.02	(0.01 - 0.03)
Bangladesh 1999-00	Actual CI	0.05	(0.04 - 0.06)
	Need predicted CI	0.01	(0.01 - 0.02)
	Need standardized CI	0.04	(0.03 - 0.04)
Bangladesh 2004	Actual CI	0.02	(0.04 - 0.06)
	Need predicted CI	0.00	(0.01 - 0.02)
	Need standardized CI	0.02	(0.03 - 0.04)
Bangladesh 2007	Actual CI	0.01	(0.00 - 0.02)
	Need predicted CI	0.00	((-0.01) - 0.00)
	Need standardized CI	0.02	(0.01 - 0.02)
Indonesia 1987	Actual CI	0.07	(0.06 - 0.08)
	Need predicted CI	0.02	(0.02 - 0.03)
	Need standardized CI	0.04	(0.04 - 0.05)
Indonesia 1991	Actual CI	0.07	(0.06 - 0.07)
	Need predicted CI	0.00	(0.00 - 0.01)
	Need standardized CI	0.07	(0.06 - 0.07)
Indonesia 1994	Actual CI	0.08	(0.07 - 0.09)
	Need predicted CI	0.01	(0.01 - 0.01)
	Need standardized CI	0.07	(0.07 - 0.08)
Indonesia 1997	Actual CI	0.04	(0.04 - 0.05)
	Need predicted CI	0.00	(0.00 - 0.00)
	Need standardized CI	0.05	(0.04 - 0.05)
Indonesia 2003	Actual CI	0.04	(0.03 - 0.04)

	Need predicted CI	-0.01	((-0.02) - (-0.01))
	Need standardized CI	0.05	(0.05 - 0.06)
Indonesia 2007	Actual CI	0.02	(0.02 - 0.03)
	Need predicted CI	-0.01	((-0.01) - (-0.01))
	Need standardized CI	0.03	(0.03 - 0.04)