A META-ANALYSIS OF THE IMPACT OF FAMILY PLANNING PROGRAMS ON FERTILITY PREFERENCES, CONTRACEPTIVE METHOD CHOICE AND FERTILITY

Gustavo Angeles, Jason Dietrich, David Guilkey, Dominic Mancini, Thomas Mroz, Amy Tsui and Feng Yu Zhang

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MEASURE Evaluation

Carolina Population Center
University of North Carolina
at Chapel Hill
123 W. Franklin Street
Suite 304
Chapel Hill, NC 27516
Phone: 919-966-7482
Fax: 919-966-2391
measure@unc.edu
www.cpc.unc.edu/measure

Collaborating Partners:

Macro International Inc.
11785 Beltsville Drive
Suite 300
Calverton, MD 20705-3119
Phone: 301-572-0200
Fax: 301-572-0999
measure@macroint.com

John Snow Research and Training Institute
1616 N. Ft. Myer Drive
11th Floor
Arlington, VA 22209
Phone: 703-528-7474
Fax: 703-528-7480
measure_project@jsi.com

Tulane University
1440 Canal Street
Suite 2200
New Orleans, LA 70112
Phone: 504-584-3655
Fax: 504-584-3653
measure2@tulane.edu

Funding Agency:

Center for Population, Health and Nutrition
U.S. Agency for International Development
Washington, DC 20523-3600
Phone: 202-712-4959

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Gustavo Angeles
Jason Dietrich
David Guilkey
Dominic Mancini
Thomas Mroz
Amy Tsui
FengYu Zhang

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Abstract

This paper presents a meta-analysis of the results of Angeles, et. al. (1996). The purpose of the original paper was to examine the evidence of the impact of family planning programs on three key sets of outcome variables: fertility preferences, contraceptive method choice, and fertility. The results from multivariate models for these outcome variables using Demographic and Health Survey (DHS) data or comparable cross-sectional data sets with family planning program variables included in the set of explanatory variables are summarized below with detailed results available in Angeles, et. al. (1996). The countries included in this paper constitute a broad geographical representation and cover countries with large population size. The specific countries are Kenya, Morocco, Tanzania, Tunisia, Zimbabwe, Bolivia, Peru, Indonesia, the Philippines, China and India.

I. Introduction

This paper presents a further analysis of the results of Angeles, et. al. (1996). The original paper is a part of a series of research papers either written or commissioned by the EVALUATION Project with the purpose of examining the evidence of the impact of family planning programs on three key sets of outcome variables: fertility preferences, contraceptive method choice, and fertility. The results from multivariate models for these outcome variables using Demographic and Health Survey (DHS) data or comparable cross-sectional data sets with family planning program variables included in the set of explanatory variables are summarized below with detailed results available in Angeles, et. al. (1996). The countries included in this paper constitute a broad geographical representation and cover countries with large population size. The specific countries are Kenya, Morocco, Tanzania, Tunisia, Zimbabwe, Bolivia, Peru, Indonesia, the Philippines, China and India.

The type of multivariate models we estimate are referred to as reduced form models, which we further elaborate on below. An important feature of this type of estimation methodology is that we cannot examine the pathways through which family planning programs affect the outcome variables but we can examine total effects. For example, a family planning program variable may have a direct effect on contraceptive method choice and an indirect effect through a reduction in ideal family size. Reduced form models will only measure the total effect and not examine the pathways through which the program operates. The advantage reduced form models have over structural models is that they are much easier to estimate especially when only cross-sectional data are available since there is no need to worry about identification problems that tend to make structural equation model estimates unstable and controversial.

In the models estimated below, we make the critical assumption that decisions about placement and intensity of the family planning program in the country are exogenous to the outcome variables. In other words, we are assuming the distribution of family planning services are, for all practical purposes, randomly assigned. This may be an unrealistic assumption and if so, the direction in which the results could be biased is a function of the true strategy used by the program. For example, if the government targeted the program to high fertility areas, it is reasonable to expect that program impact will be biased downwards while if the program was targeted to areas where it was felt demand for services was high, one would expect an upward bias to the estimated impact. Unfortunately, estimating the true impact of programs in either of these cases is difficult (for example, see Angeles, Guilkey, and Mroz, 1998). In this paper we simply indicate some anomalous results and suggest that they may be due to targeted program placement.

The plan of the paper is as follows. In the next section we lay out our methodology and discuss the types of variables that are included in our reduced form models. Section III discusses the countries included in the estimations, describes the survey for each country, and provides descriptive statistics. Section IV presents the multivariate results along with simulations that allow us to quantify program impact. We conclude in Section V.

II. Methodology and Model Specification

Our reduced form analysis is guided by a conceptual framework that takes into account both demand and supply side factors that can affect fertility (see, for example, Easterlin and Crimmins 1985; Rosenzweig and Schultz 1985; Schultz 1986; and Buckner, Tsui, Hermalin, and McKaig, 1995). Figure 1 presents a simplified version of the conceptual framework presented in Buckner, Tsui, Hermalin, and McKaig (1995) and is similar to the diagram in Schultz (1986). An overview of the mathematical formulation for static models of the determinants of fertility can be found in Jensen (1985).

The simple model hypothesizes that exogenous individual background factors, such as the woman's age and education, household background factors, such as household assets, and family planning program variables all affect the woman's fertility preferences. Along with the direct effects of household and family planning program variables, fertility preferences affect contraceptive practice. Contraceptive practice, in turn, is a major determinant of fertility.

The three fertility related outcome variables discussed in this paper are a subset of the variables analyzed by Angeles, et. al. (1996):

1. Ideal family size

This variable is available in all DHS data sets. It is obtained by asking women with no children the exact number they would like to have during their lifetime and by asking women with children how many they would have if they could start over.

2. Current method of contraception

For the DHS countries, we consider three categories for this variable: non-use, use of traditional methods, and use of modern methods. For India, we combine non-use and use of traditional methods and for China and India, we break modern use down into specific methods.

3. Yearly birth probability

For all countries except India, we use five-year birth histories to estimate this relationship; births in the last three years are used in India due to lack of data.

Outcome variables we do not consider in our reduced form analysis are whether or not the woman is currently pregnant and whether or not the woman is currently married. These variables are clearly endogenous and could be influenced by family planning programs. As shown below, the reduced form estimation method substitutes out for all right-hand-side endogenous variables and simply examines total program effects on the selected set of outcomes. Thus, the sample used in the estimations discussed below is all women between the ages of 15 and 49 with no explicit control for these variables. A couple of exceptions to this are Morocco and Tunisia, which only include currently married, and India, which includes women between the ages of 13 and 49.

To fix ideas, we first discuss a simple structural equations model, based on Figure 1, for the three sets of outcomes. The statistical form for a structural equations model that would relate the set of outcomes listed above to exogenous individual, household, and community characteristics could take on a three equation form with the first equation modeling fertility preferences:

$$D_{ij} = X_{ij}^{D}\beta^{D} + P_{j}^{D}\alpha^{D} + \mu_{j}^{D} + \varepsilon_{ij}^{D} \quad (1)$$

This equation states that fertility preferences for woman i (i=1,2,...N_j) from community j (j=1,2,...,J) are a function of X, a set of individual characteristics including age, education and household wealth among other variables; P, which represents family planning program variables such as distance to the nearest family planning facility and whether or not a CBD is active in the community; and two unobservable variables. The μ represents unmeasured characteristics of the community that affect fertility preferences such as village leaders' attitudes towards large family sizes or the degree of motivation of family planning workers in the community. The ϵ represents unmeasured variables at the individual level such as the woman's perception of her fecundity and her partner's family size desires.

The second equation models the contraceptive method choice decision:

$$C_{ij} = D_{ij}\gamma^{C} + X_{ij}^{C}\beta^{C} + P_{j}^{C}\alpha^{C} + \mu_{j}^{C} + \varepsilon_{ij}^{C} \quad (2)$$

This equation states that contraceptive method choice is a function of observed and unobserved community and individual-level variables as in the fertility preference equation. In addition, it is hypothesized that current method choice is a function of fertility preferences, measured as ideal family size. Note that contraceptive method choice is typically modeled within the framework of a multinomial logit model. We simply use the linear framework to make the exposition as straightforward as possible.

The final equation in the system models fertility:

$$F_{ij} = C_{ij}\delta^F + X_{ij}^F\beta^F + P_j^F\alpha^F + \mu_j^F + \varepsilon_{ij}^F \quad \textbf{(3)}$$

where all terms are as defined above and it is assumed that contraceptive method choice affects fertility.

As specified, the fertility preferences equation is already in reduced form since there are no right-hand-side endogenous variables and we must assume in this paper that program availability is exogenous. The reduced forms for the other two equations can be found by substituting out for the endogenous right-hand-side variables. For example, the reduced form fertility equation takes the following form:

$$F_{ij} = X_{ij}\pi_1^F + P_j\pi_2^F + v_j^F + \xi_{ij}^F \quad \textbf{(4)}$$

where no superscripts on X and P indicate that all X's and P's enter the reduced from. The error still has community and individual components that are linear combinations of the errors in the three structural equations.

This paper summarizes the results from reduced form equations of the general form laid out in equation (4) for all outcome variables. Estimation of equations (2) and (3) would require us to be able to identify exogenous variables that only affect specific outcomes. This can be quite difficult with cross-sectional data sets and even if "technical" identification is achieved, the results can be unstable. For more details, see Bollen, Guilkey, and Mroz (1995). We use the ordinary least squares estimation method for ideal family size since there was a broad range of responses for this outcome variable. Mulitinomial logit is used for current method choice and logit is used for fertility. In all cases, the estimated coefficient standard errors are adjusted for correlation caused by the community-level errors.

The dependent variables used in the analysis are described above. For the DHS countries especially, we tried to make the set of independent variables as consistent as possible while still utilizing some of the unique features of each data set:

1. Woman's age

The woman's age was defined as a categorical variable with age 19 and below as the excluded category. Age categories were used due to the hypothesized nonlinear relationship between age and the outcome variables, especially fertility.

2. Woman's education.

This variable was also specified as a set of dummy variables with the categories being country specific. The excluded category is no education.

3. Residence status

We included a dummy variable indicating whether or not the woman resides in a rural area. Additional classifications as described in Angeles, et. al. (1996) were also included for some countries.

4. Religion

Country specific dummy variables for religion were included with no religious affiliation as the excluded category.

5. Assets

Dummy variables indicating household possession of certain types of assets were included in each model. For the DHS countries, household ownership of a bicycle, motorcycle, car, radio, television and refrigerator were included as well as indicators for whether or not the household had electricity and good floors. Variables indicating household access to good water and sanitation were also included in all DHS country models.

6. Access to Family Planning

The specification of this set of variables is of central importance to this paper. Initially, we defined access for all DHS countries by a set of three dummy variables indicating a particular type facility with family planning was within 5, 6 to 10, and 11 to 30 kilometers of the community with the omitted category being no access within 30 kilometers. We found, however, that the results across countries were robust to a specification including only a single dummy variable indicating access within 10 kilometers. Simply including measures of current access may not be sufficient to measure the impact programs have on the outcome variables, fertility especially. Therefore, we redefined the access measures in the following way: access within 10 kilometers for 5 years or less, access within 10 kilometers for 6 to 10 years, and access within 10 kilometers for 11 or more years. This set of three dummy variables, with an omitted category of no access within 10 kilometers, was defined for all types of facilities that were relevant for any particular country.

We included separate sets of dummy variables for each type of facility that is available in each specific country. For example, there are hospitals, health centers and dispensaries in Tanzania and so three sets of dummies indicating access and duration of access were included for each of these three types of facilities. In some countries, Kenya for example, we did not know how long family planning was available and so we could only include dummy indicators indicating access is currently within ten kilometers. In addition to access to fixed facilities, we also included variables that indicate that a CBD is available in the community or if a mobile clinic visits the community if this type of information was available for a specific country. Other country specific variables included, for example, the presence of outreach programs in the community, the presence of a UMATI field worker (Tanzania), and the presence of a family planning distribution post in Indonesia.

Unfortunately, except for indicators for the availability of outreach programs and CBD programs, we do not have program variables that are specific to the IEC component of many family planning programs. A variable that is often used is the respondent's self report of having heard a family planning message or of having listened to a family planning soap opera. It is highly likely that women that are using family planning services are more likely to remember such messages which would lead to a bias in the estimated impact of this variable.

III. Descriptive Statistics

A very complete set of descriptive statistics for all countries is available in Angeles, et. al. (1996). Table 1 presents a few summary measures for the explanatory variables and the means for each outcome variable are in Tables 2-4. The sample sizes ranged from a high of over 56,000 in the China under-35 sample to a low of 2,481 in the Morocco 1995 data set. Table 1 presents descriptive statistics for a subset of the explanatory variables. Different education categories were used for different countries, but the omitted category for all countries was no education and so we present the average for this category. In Morocco in 1992, almost 77% of the women have no education while, at the other extreme, only 2.6% have no education in the Philippines. There is considerable variation in education even within the same region of the world. For example, Kenya and Zimbabwe have half as many uneducated women as Tanzania, and India, with 68.9% with no education, is much higher than all of the other Asian countries. There is much less variability in the percent of women in the 25 to 29 age group which is a prime childbearing age range. The highest percentage is in Tunisia with around 21% and the lowest is in Zimbabwe with 13.8%.

The rest of Table 1 presents statistics on accessibility to family planning. It is important to note that the variables described in this table in many cases are not the same as were used in the multivariate analysis since, where possible, we broke access down into duration of availability. Nevertheless, the statistics allow for useful comparisons. The statistics show that the three Asian countries, China, Indonesia, and the Philippines, have a high degree of access relative to countries in other regions of the world while the sub-Saharan African countries tend to lag behind. Both Tunisia and Morocco have access levels of over 80% within ten kilometers to at least one type of family planning facility and are quite close to the Asian countries. We cannot compare Peru directly to the other countries since access was defined to be within five kilometers instead of ten, and India did not use measures of access comparable to the other countries and so we do not have statistics for it. We also see that around half of the countries had access to some type of mobile family planning service in the form of either a mobile clinic or a CBD but there is tremendous variability in the number of communities served by these programs. For example, only 3.7% of the sample clusters are served by a CBD program in Bolivia while 87.8% of the communities in Indonesia have access.

Tables 2-4 present descriptive statistics and the results from estimating multivariate models for each of the three outcome variables. In this section, we only discuss the rows that display the means of the dependent variables. The remaining rows of each table are discussed in the next section.

Table 2 presents results for ideal family size. Ideal family size is highest in the Tanzania 1991 sample where families on average desired more than six children, while the lowest is 2.5 children in Peru. It is interesting to note that ideal family size had dropped to 5.5 children in Tanzania in 1994 in a survey that returned to the same sample clusters that were visited in 1991. sub-Saharan African women desired the largest families on average with the two Latin American countries (Peru and Bolivia) desiring the lowest with North African and Asian countries in the middle.

Statistics for modern contraceptive use are presented in Table 3. For most countries, mutinomial logit was used with three categories for the dependent variable: modern use, traditional use, and no use. In India and China, modern use was disaggregated into specific methods in the estimation but we have combined categories in the summary table to make comparisons across countries more direct. The table shows large variability across countries with a high of 93.2% for the 35-and-older sample in China to a low of 5.1% for Tanzania in 1992. While the percentages are similar for the two North African countries, there is typically considerable variation within other regions. For example, Kenya has double the modern use of Tanzania 1994 while it is 30% below Zimbabwe. Peru has approximately double the rate of Bolivia, and Indonesia's modern use is almost three times that of the Philippines.

Table 4 presents results for yearly birth probabilities. In interpreting these results, it may be useful to keep in mind that a 3.3% increase in the yearly birth probability implies a difference of one child over a

30-year reproductive lifetime, if we make the dubious assumption that birth probabilities remain stable over this period of time. The range of probabilities is from 21.9% in Tunisia to 12.8% in Peru, excluding China which is broken down by age group. As a group, the Asian countries have relatively low birth probabilities with the African (both North and sub-Saharan) relatively high.

IV. Multivariate Results

Angeles, et. al. (1996) present all of the multivariate results including the estimated regression coefficients and simulations that can be used to help quantify the size of the effects of the program variables on the outcome variables. The results for the other explanatory variable such as age and education were much as expected and are discussed in Angeles, et. al. (1996). Tables 2-4 present four summary measures. The first two summary measures are based on a simulations that use the estimated coefficients from the regressions for each dependent variable to obtain predictions for this dependent variable. The first simulation was done by setting all access measures to zero for all women in the sample which means that we assume that all fixed facilities are at least 10 kilometers from the village in which the woman resides and no CBD or mobile clinic visits her village. We kept her individual characteristics at their actual values, predicted the value of the outcome variable for each woman, and then averaged across all women in the sample for each country. A possible problem with this measure is that the simulation includes all estimated effects including those that are not statistically significant, however, we also did simulations using only significant coefficients and got similar results. The second set of simulations was done by assuming universal access to all types of family planning services in a country. For countries where access is broken down by duration, we chose the intermediate duration of six to ten years and assumed that each individual lived within ten kilometers of a facility that had provided family planning for six to ten years.

The third measure is the percentage of the program variable coefficients that are statistically different from zero using a 10% test. This number could easily be manipulated for any particular country by expanding the number of categories for strongly significant variables and collapsing categories for insignificant variables or dropping them altogether. We feel the measure has some validity here because we estimated a standard model across all countries and decided a priori which country specific variables to include. The fourth measure is the percentage of these significant coefficients that are of the correct sign which means that the program variable is associated with either a decrease in ideal family size or an increase in modern contraceptive use or a decrease in the yearly birth probability.

Table 2 presents results for ideal family size. Consider the results for Kenya where the average reported ideal family size is 3.7 children. If all access measures are set to zero, predicted ideal family size shows a modest increase to 3.8 children. If you average the actual mean ideal family size across the ten countries for which we have data, you get 3.8 children. If you average the simulated mean ideal family size when all access is set to zero across the ten countries you get 3.9 children. Finally, if you average the simulated ideal family size when we assume universal access you get 3.8 children. In other words, on average, we find no evidence of an effect of access to services on ideal family size. Angeles, et. al. (1996) present additional simulations for each program variable where program impact is determined by setting a program variable to zero and then to one (one indicating access). If you take their simulated impacts for all of the significant variables and average across countries, you get zero, in other words, no change on average in ideal family size.

A consistent set of results is obtained when one examines the pattern of significant coefficients. It is clear from the rows of the table reporting the percent of the program variables that are significant and the percent that are significant and of the correct sign that few program variables have had an impact on ideal family size, and when they do have a significant impact, the effect is highly likely to be of the incorrect sign. The obvious conclusion from our results is that program variables do not seem to have an effect on ideal family size. However, it is important to note our models did not include the individual's self report of having heard a family planning message, a variable that is typically available in DHS data. The reason for this exclusion is that this variable is highly endogenous and it would be exceedingly difficult if not impossible to correctly measure the effect of this variable in a cross sectional data set (see Westoff, et. al. 1994, for a complete discussion of the problems involved). Clearly exogenous measures for IEC programs need to be gathered so that these major components of family planning programs can be properly tested for impact.

The results for modern contraceptive use are reported in Table 3. Again using Kenya as an example, we see that modern use was 20.6% in 1993 and it would drop to 15.9% if there was no family planning from any source within 10 kilometers, a percentage decrease of almost 23%. If you assume universal access to all types of family planning, modern use jumps to 25.3%, a percentage increase of 59% from the 15.9% level when no access is assumed. The strange results for Zimbabwe are due to a very large, perverse effect of mission hospitals on modern use (modern use drops to only 14% from the actual level of 27.2% when services are made universally available). If one excludes China and Zimbabwe, average prevalence of modern use across the other eleven datasets is 24.4%. Simulated prevalence with no access and universal access is 20.6% and 26.1% respectively representing a 27% increase. The country with the largest decrease in modern use from 43.9% to 27.9% is Tunisia which represents a decrease of almost 36%. Countries with very small decreases or even increases in modern use when access is set to zero from universal availability are Morocco 1992 the Philippines, China, and Bolivia.

The results for the percent of the program variables that are significant and the percent significant and of the correct sign show much more favorable results for modern use as opposed to ideal family size. On average, much higher percentages of program variables are significant and the ones that are significant are often of the correct sign. Exceptions are Morocco in 1992 (note the dramatic improvement in 1995) and the 35-and-over age group for China.

The fertility results are reported in Table 4. Unfortunately, the favorable results for modern contraceptive use have been translated into more modest impacts on fertility. In Kenya, for example, we see that the average yearly birth probability increases from 17.6% to 17.9% when we simulate the effect of no program access within 10 kilometers. This 0.3% increase in the yearly birth probability would result in an increase of 0.1 children over a 30-year reproductive lifetime. We again obtain anomalous results for Zimbabwe. The mean yearly birth probability is 16.8% and it drops to 10.6% if universal access is assumed. This is almost solely due to the large negative impact of the ZNFPC clinics on birth probabilities. Our simulations make these clinics universally available when, in fact, they are only available to 11.3% of the women in our data and only in urban areas. The average yearly birth probability across ten datasets, excluding China and Zimbabwe (Tanzania 1994 did not gather birth histories), is 16.2%. The simulated average when there are no family planning services across the nine countries is 16.6%, while the simulated average drops to 15.5% when there is universal access. This represents a 0.33 decrease in the number of children a woman would have over thirty childbearing years. Two countries where there were somewhat larger effects are Tunisia and Tanzania 1991, with a 6.3% increase in the yearly birth probability in Tunisia and a 2.6% increase in Tanzania when access is outside the 10 kilometer radius rather than being universally available.

The results for the percent of the program variables that are significant and the percent significant and of the correct sign indicate inconsistent program effects. In four countries (Kenya, Morocco 1992, Morocco 1995, and the Philippines), no program variables are significant at all. In countries with significant program effects, the direction of impact is sometimes perverse -- more than 50% of the time in Bolivia and in the older Chinese sample.

Table 5 presents two simple regressions that attempt to summarize the results for the percent of program variables that are significant and the percent significant and of the correct sign. The data for the regressions are obtained from Tables 2-4 where the independent variables are the sample size in cross sectional data sets, dummy variables for whether the data are from regressions with ideal family size or yearly birth probability as the dependent variable (modern contraceptive use is the reference category) and a set of dummies for the region of the world (the reference category is North Africa).

The top half of Table 5 presents results with percent of the program variables significant as the dependent variable. The first result to note is the unsurprising result that we obtain more significant program effects as sample size increases. However, the size of the effect is somewhat smaller than anticipated with an increase in sample size of 1,000 only associated with a 1% increase in the number of significant program variables. The dummy variables for ideal family size and yearly birth probability nicely summarize what is obvious from the preceding discussion: the majority of significant program effects are present for modern contraceptive use. We obtain almost 36% fewer significant effects when ideal family size is the dependent variable in the original regressions and almost 29% fewer when yearly birth probability is the dependent variable. Finally, there does not appear to be any regional pattern as all regional dummies are small with large standard errors.

The second half of the table presents results for the percent of the program variables that are significant and of the correct sign. We see from the F statistic and the adjusted R^2 that we have very poor explanatory power in this regression, with the only significant variable being the dummy for ideal family size. However, it is still useful to examine the point estimates of the coefficients. The dummy for ideal family size indicates that if ideal family size is the dependent variable in the original regression, there are 32% fewer program variables that are significant and of the correct sign relative to results for modern contraceptive use. Yearly birth probability is also associated with fewer desirable results but the estimated coefficient is much smaller at around 14%. All of the regional dummies are positive indicating that we obtained more correct sign results in all regions relative to North Africa. An examination of the point estimates of the coefficients indicate that more correct sign results are obtained in Asia, followed by sub-

Saharan Africa with Latin America only having around 7% more correct results than North Africa.

V. Conclusions

This paper further analyzes results presented in Angeles, et. al (1996) where reduced form models of the determinants of fertility preferences, contraceptive method choice and fertility for 11 countries were estimated. The focus of the research was to measure the impact of the various components of a country's family planning program on these important outcome measures. The individual-level control variables such as age, education and household assets that were included in the models behaved much as would be predicted. Female education, in particular, almost universally yielded desirable outcomes: lowering ideal family size, increasing modern contraceptive use, and decreasing fertility. The results for the program variables can best be described as mixed. For ideal family size, the proportion of significant program effects out of the total number of effects estimated was small and the signs were just as likely to be perverse as to be of the desired sign. These results coincide with the literature review which turned up little evidence of program effects on fertility preferences.

The results for contraceptive method choice are much more favorable to family planning programs. Relative to fertility preferences and actual fertility, there are large numbers of significant program effects and the sign of the program effects indicate a positive impact on modern contraceptive use in two-thirds of the cases where a significant effect is measured. These results also mesh well with the literature review and are not all that surprising since the focus of many family planning programs is increased contraceptive prevalence. Excluding China and Zimbabwe, our simulations averaged across countries indicate that modern use would drop from 25.3% to 15.9% when one moves from universal access to the absence of access to family planning.

These positive results for contraceptive use do not seem to have been translated into major reductions in fertility in most countries. If one averages across countries, the simulated effects of family planning programs on fertility are relatively small indicating a 0.33 of a child increase in fertility over thirty years in the absence of program variables relative to universal access to family planning. In addition, the significant program effects for fertility are sometimes perverse, showing decreased fertility associated with decreased access to family planning.

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Table 1. Explanatory Variables

Country	Kenya 1993	Tanzania 1991	Tanzania 1994	Zimbabwe 1989	Morocco 1992	Morocco 1995	Tunisia 1988
Sample Size	7540	8718	4225	4201	5118	2481	3967
Percent age 25-29	15.9%	16.9%	18.4%	16.2%	17.3%	17.1%	20.8%
Percent no education	17.4%	35.0%	30.2%	13.8%	77.4%	71.0%	56.5%
FP Hospital within 10 km	33.4%	24.0%	29.6%	28.9%	Na	Na	36.6%
FP Clinic within 10 km	61.4%	26.4%	21.9%	77.6%	83.1%	85.8%	59.7%
Other type facility with 10 km	37.8%	51.9%	62.9%	11.3%	Na	Na	84.1%
CBD	54.6%	9.7%	Na	62.9%	Na	Na	Na
Mobile Clinic	24.3%	16.6%	Na	27.9%	Na	Na	37.2%

	Bolivia 1994	Peru 1992	Indonesia 1994	Philippines 1993	China 1992, age 34 or less	China 1992, age 35 or more	India 1995
Sample Size	8603	15882	27971	15029	56491	26882	45104
Percent age 25-29	15.8%	16.2%	19.6%	16.0%	Na	Na	19.8%
Percent no education	12.7%	7.4%	17.0%	2.6%	12.4%	37.5%	68.9%
FP Hospital within 10 km	44.3%	13.2% (5 Km)	48.5%	60.6%	Na	Na	Na
FP Clinic with 10 km	29.4%	35.0% (5 Km)	85.5%	Na	95.0%	95.9%	Na
Other Type Facility with 10 km	54.8%	38.1% (5 Km)	45.9%	82.1%	74.3%	75.7%	Na
CBD	3.7%	10.8%	87.8%	Na	Na	Na	Na
Mobile	0.4%	5.1%	56.1%	15.9%	Na	Na	Na

Table 2. Ideal Family Size

Country	Kenya 1993	Tanzania 1991	Tanzania 1994	Zimbabwe 1989	Morocco 1992	Morocco 1995	Tunisia 1988
Mean Dependent variable	3.731	6.144	5.578	4.886	3.879	3.719	3.497
Simulation for no FP from any source	3.849	6.199	5.685	4.745	3.976	3.659	3.742
Simulation for FP available from all sources	3.607	5.595	5.643	5.615	3.941	3.584	3.379
Percent program variables significant	18%	50%	25%	12%	0%	0%	0%
Percent significant and correct sign	66%	44%	66%	0%	Na	Na	Na

	Bolivia 1994	Peru 1992	Indonesia 1994	Philippines 1993	China 1992, age 34 or less	China 1992, age 35 or more	India 1995
Mean Dependent variable	2.521	2.503	3.099	3.269	Na	Na	3.669
Simulation for no FP from any source	2.389	2.526	3.1	3.366	Na	Na	3.767
Simulation for FP available from all sources	2.237	2.277	3.126	3.246	Na	Na	3.564
Percent Program variables significant	38%	0%	36%	17%	Na	Na	31%
Percent significant and correct sign	33%	Na	50%	100%	Na	Na	75%

Table 3. Modern Contraceptive Use

Country	Kenya 1993	Tanzania 1991	Tanzania 1994	Zimbabwe 1989	Morocco 1992	Morocco 1995	Tunisia 1988
Mean of Dependent Variable	20.6%	5.1%	11.2%	27.2%	35.5%	42.4%	40.4%
Simulation for no FP from any source	15.9%	3.8%	8.0%	24.9%	35.7%	36.1%	27.9%
Simulation for FP available from all sources	25.3%	12.5%	17.1%	14.0%	29.3%	41.4%	43.9%
Percent program variables significant	80%	17%	22%	18%	25%	75%	80%
Percent significant and correct sign	100%	100%	100%	50%	0%	100%	75%

	Bolivia 1994	Peru 1992	Indonesia 1994	Philippines 1993	China 1992, age 34 or less	China 1992, age 35 or more	India 1995
Mean Dependent variable	11.9%	19.7%	42.7%	15.2%	46.8%	93.1%	24.2%
Simulation for no FP from any source	9.2%	18.9%	35.8%	14.8%	44.9%	92.1%	21.0%
Simulation for FP available from all sources	0.0%	27.7%	39.8%	15.8%	47.5%	93.8%	34.0%
Percent Program variables significant	54%	43%	71%	33%	100%	100%	100%
Percent significant and correct sign	100%	100%	80%	100%	66%	33%	86%

Table 4. Yearly Birth Probabilities

Country	Kenya 1993	Tanzania 1991	Tanzania 1994	Zimbabwe 1989	Morocco 1992	Morocco 1995	Tunisia 1988
Mean Dependent variable	17.6%	19.1%	Na	16.8%	19.8%	12.9%	21.9%
Simulation for no FP from any source	17.9%	19.8%	Na	16.6%	20.2%	12.8%	24.4%
Simulation for FP available from all sources	17.3%	17.2%	Na	10.6%	19.5%	11.5%	18.1%
Percent program variables significant	0%	50%	Na	18%	0%	0%	50%
Percent significant and correct sign	Na	66%	Na	100%	Na	Na	100%
	Bolivia 1994	Peru 1992	Indonesia 1994	Philippines 1993	China 1992, age 34 or less	China 1992, age 35 or more	India 1995
Mean Dependent variable	15.8%	12.8%	12.9%	13.3%	9.8%	1.8%	15.7%
Simulation for no FP from any source	15.5%	12.8%	12.4%	13.5%	10.0%	2.1%	16.7%
Simulation for FP available from all sources	17.2%	13.2%	12.6%	13.5%			15.2%
Percent Program variables significant	54%	29%	29%	0%	33%	50%	86%
Percent significant and correct sign	33%	50%	100%	Na	50%	33%	66%

Table 5. Regression Results

Dependent Variable: Percent Program Variables Significant			
N = 39	F(6,32) = 5.32	Prob > F = 0.0007	Adj R^2 = 0.41
Independent Variable	Coefficient	Standard Error	t
Sample Size	0.001	0.0004	2.205
Ideal Family size	-35.8299	9.4053	-3.81
Yearly Birth Probability	-28.6211	9.1609	-3.124
Sub-Saharan Africa	-0.4942	10.7484	-0.046
Asia	-4.1118	16.7139	-0.246
Latin America	2.445	13.0765	0.187
Constant	43.2057	9.7148	4.447
Dependent Variable: Percent Significant and Correct Sign			
N = 31	F(6,24) = 1.01	Prob > F = 0.4393	Adj R^2 = 0.00
Sample Size	-0.0006	0.0006	-0.895
Ideal Family size	-32.4421	14.319	-2.266
Yearly Birth Probability	-13.7193	13.3968	-1.024
Sub-Saharan Africa	19.0776	19.1234	0.998
Asia	27.9999	27.0018	1.037
Latin America	7.3519	21.5981	0.34
Constant	74.4005	15.8703	4.688

Figure 1: A simpified Model of FP Demand and Supply Effects on Fertility