Modeling Synergies between Women-centered Interventions and Family Planning

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Background

Currently there is much interest in enhancing the roles and status of women in developing countries as well as revitalizing programs for reproductive health and family planning (e.g. the Obama Administration's "Global Health Initiative".) Many broad statements are made connecting women-centered initiatives with health and development outcomes, but there is little empirical evidence behind such statements. An empirically-based simulation model was developed as an advocacy model that explicitly links women-centered program strategies to health and development outcomes based on statistical evidence. It is intended to be used by women leaders to advocate for appropriate policies and programs to support women-centered programs and family planning.

Main Question

The main research question was: "to what extent can strategies that focus on women and girls benefit health and development outcomes, including child survival, maternal mortality, family planning, and general economic development?"

Methods

A dynamic computer simulation model was developed that links key women-centered indicators with key development indicators. Statistical relationships were established between key indicators using international cross-section data. Inputs include indicators on women's education, family planning effort, women's empowerment and proximate fertility determinants. The human development Index (HDI) was used as a quality of life and development organizing framework for outcomes since it includes education, life expectancy and income per capita. Additional outputs include standard demographic variables as well as child survival and maternal health indicators. The statistical relationships which were established between input and output measures are built into the model.

The model comprises two main sub-models: (1) the **Demographic Sub-Model**, which includes variables that determine the growth and age structure of the population and (2) the **Economic Development Sub-Model**, which calculates the HDI as the main development indicator. The Economic Development Sub-Model is linked to the Demographic Sub-Model through population variables, including the number of births (measured by the total fertility rate) and life expectancy.

There are six "policy variables**"** that can be changed to reflect the specific program strategies:

1. Contraceptive Security Access Index
2. Women's empowerment/gender norms, measured by the percent of women saying wife beating can be justified
3. Girls' mean years of education completed
4. Girls' expected years of education

5. Postpartum insusceptibility
6. Sterility (infertility)

Results

The model and research show that strategies with a women-centered approach have a positive impact on infant and under-5 mortality, and on maternal mortality as well as on family planning and components of the HDI. Similarly, family planning strategies have a positive effect on the HDI and on women's education. When both strategies are implemented **simultaneously** synergies are realized and the gains are even greater.

The model was tested and validated recently in Mali. Mali was chosen because it faces a lot of the issues that the approach was designed to address. Fertility is high, with a TFR of 6.6 and with a contraceptive prevalence rate of 8.2 percent (all methods). Economically, although GDP per capita is just over $1,000, Mali is in the bottom ranking on the HDI scale at 160 out of 169 countries. The IMR is 96 deaths per 1,000 births, and the U5MR is 191. Similarly, there are significant women's empowerment issues. More than 75 percent of women report finding it acceptable for their husbands to beat them and 85 percent have been subjected to some form of female genital mutilation.

We ran three scenarios. In the first, the "FP only" scenario, we assumed an increased contraceptive effort that nearly doubled and an increase in PPI. All other control indicators are assumed to remain unchanged. In the "women-centered" scenario we assumed increases in girls' education and changes in gender norms, but no policy intervention to change FP use directly. In the third scenario we combined both the FP and women-centered scenarios.

Some of the results on selected demographic indicators are shown in Table 1. We see that the model shows not only significant impacts of women-centered policies on these indicators but also significant synergies. For example the TFR falls to 2.4 under a combined strategy as compared to only 4.6 and 5.0 under the FP and women-centered strategies alone.

Table 2 illustrates the economic impacts. The main economic indicators are capital investment per capita, GDP per capita, and the HDI. Consistent with much of the economic literature we see only a modest impact on GDP per capita of family planning. However a women centered strategies, primarily through education boosts GDP per capita to three times what it would be with family planning alone while a combined strategy increases it even more. For expository reasons, we report the HDI ranking of Mali under each scenario relative to other countries in the base year[1]. We see again that a combined strategy achieves synergistic results.

Conclusion and Knowledge Contribution

Strategies that focus on women and girls can have positive effects on the health outcomes as well as on the HDI and can reinforce family planning strategies. When family planning strategies are combined with women-centered strategies the effects are stronger.

[1] Of course, during the 40-year simulation period, the HDI of other countries may change and with it their own ranking.

Table 1. Scenario Results of Demographic Indicators (Mali)

	% Married			CPR			TFR		
	FP Only	Women-Centered	Combined	FP Only	Women-Centered	Combined	FP Only	Women-Centered	Combined
2010	84.8	84.8	84.8	8.2	8.2	8.2	6.6	6.6	6.6
2015	84.8	82.9	82.9	9.8	9.7	11.6	6.3	6.3	6.1
2020	84.8	81.1	81.1	11.6	10.9	15.5	6.1	6.1	5.6
2025	84.8	79.4	79.4	13.4	12.2	19.9	5.8	5.9	5.0
2030	84.8	77.8	77.8	15.4	13.3	25.1	5.6	5.7	4.5
2035	84.8	76.3	76.3	17.6	14.4	30.9	5.3	5.5	3.9
2040	84.8	74.8	74.8	19.8	15.5	37.5	5.1	5.3	3.5
2045	84.8	73.4	73.4	22.2	16.6	44.9	4.8	5.2	2.9
2050	84.8	72.1	72.1	24.6	17.7	53.3	4.6	5.0	2.4

Table 2. Projected Economic Indicators and HDI Ranking (Mali)

	Capital per Capita			GDP/pop			HDI Ranking		
	FP Only	Women Strategy	Combined	FP Only	Women Strategy	Combined	FP Only	Women Strategy	Combined
2010	$252	$252	$252	$1,171	$1,171	$ 1,171	161	161	161
2015	$251	$295	$292	$1,174	$1,458	$1,448	160	157	157
2020	$253	$371	$377	$1,184	$1,851	$1,871	160	155	155
2025	$258	$464	$483	$1,205	$2,303	$2,363	159	154	153
2030	$272	$584	$ 637	$1,253	$2,843	$3,004	158	146	144
2035	$287	$711	$810	$1,303	$3,405	$3,700	158	143	135
2040	$298	$838	$995	$ 1,340	$3,970	$4,427	158	133	132
2045	$307	$966	$1,212	$1,371	$4,543	$ 5,241	158	132	128
2050	$317	$1,117	$1,491	$1,406	$5,183	$ 6,219	157	129	121