Methodological Note

Study on the Costs and Benefits of Increased Investment in Family Planning in Cameroon

Guttmacher Institute and IFORD

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I. OVERVIEW

The overall methodology follows Guttmacher Institute's *Adding It Up* (AIU) series of publications (see www.guttmacher.org). Unlike the original global AIU analysis, the country-specific exercises use an Excel-based model called the AIU Country Model. Version 2 of the model became operational in February 2014 and can be obtained free of charge from Guttmacher Institute.[1] The following is a brief overview of the model.

Overall Objective of Model

The purpose of the model is to estimate net savings from increased investment in family planning in terms of:

- Health gains

- Financial gains

The model accomplishes this objective by comparing costs under four scenarios:

- Scenario 1: No modern contraceptive use

- Scenario 2: The actual level and pattern of contraceptive use

- Scenario 3: All unmet need is satisfied

- Scenario 4: 50% of unmet need satisfied

Methodology

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[1] However, the data for any particular country application are not available since they may have been obtained under the condition of confidentiality.

- Most of the model consists of straightforward accounting-type calculations

- "Unmet need" is defined as unmet need for <u>modern</u> contraception

- No special calculation considerations are needed for scenarios 1 and 2

- However, we need a way to estimate unwanted pregnancies under scenarios 3 and 4

Key Methodological Point

We estimate unwanted births in two ways:

- First, we use wantedness data from Demographic and Health Surveys (DHS)

- Second, we use failure rates (Trussell 2007) for the various contraceptive methods (we include "no use" as a method with its own failure rate)

- We then adjust the failure rates to give the same number of unwanted births as the DHS data give

- The adjusted rates are then used in scenarios 3 and 4

More Methodology

- Some tables that disaggregate results by region do not yield the same totals as the corresponding tables disaggregated by women's wealth status

- Therefore, we adjust the wealth-status tables to equal the regional totals

- Two macros are used to do some further esoteric adjustments (see section IV below)

Applications of the Model

- So far, the model has been used for studies in Ethiopia, Uganda, Burkina Faso, Cameroon and Malawi

- The results have been reported in eight-page *In Briefs* (all very similar in format)

Data Inputs

- DHS (a major source)

- Government population estimates

- Data on costs of family planning (FP) and maternal and newborn health (MNH) care

- Data on incidence rates of MNH care complications

- Data on disability-adjusted life years (DALYs) from the World Health Organization

II. FAMILY PLANNING AND CONTRACEPTION

Estimates of Contraceptive Cost per User per Year

Worksheet: ORIG-Cost; Variable: P21[2]

Data on actual importation by the Ministry of Health of contraceptives for 2012 were used to estimate the commodity cost per unit and per couple-year of protection (CYP) of different methods. The CYP costs range from US$0.11 for IUDs to US$51.21 for female condoms.

Estimates of Cost per CYP from ACMS Data

Worksheet: ORIG-Cost; Variables: P03, P04

The Cameroonian Social Marketing Association (ACMS) furnished data on the costs and results of two family planning programs, the Women's Health Project (WHP) and the Choices Opportunity Fund (COF), for the years 2011 and 2012. They also furnished us with estimates of the number of minutes spent for each family planning service. Because costs were broken down by accounting category, which was not useful for this study, the total cost of each program was used and apportioned among the services provided (i.e., the various contraceptive methods). Note that some summations in the data provided were incorrect, and adjustments were made accordingly.

The table "Duration of FP consultations" estimates the total time taken to supply family planning methods for one year of use. Method-specific assumptions are shown to the right. The table "Total effort" calculates the total minutes expended in family planning consultations by method and the share of total cost by method. It also estimates for the WHP program the cost of each method per CYP—the ultimate objective of these calculations. The equivalent table for the COF program was also constructed. The final estimates for cost per CYP of the two programs were then combined into one table.

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[2] The worksheets and cells in this note refer to Version 2 of the Excel-based AIU Country Model. The model is available on request from Guttmacher Institute.

We found, however, that this method produced a cost per CYP for condoms that was very high ($39.84 per CYP, compared with $17–$22 in other AIU country studies). Attempts to get clarification from the ACMS were not successful, and it was decided not to use the condom cost per CYP from the ACMS data. The main reasons: Most condom distribution may be for "double protection" for women using other methods, and the length and number of visits for condoms were not well defined. The methodology used is described in the following section.

Estimates of Cost per User per Year of Condom Use

Worksheet: IntDemographic; Cells: Q104-S114; Variable: DEM06[3]

We used data from AIU3 to get the direct costs per CYP (the term CYP is used loosely here to mean use per couple per year) of male and female condom use.[4] We used ACMS data on the relative proportions of condom use represented by use of male condoms and by use of female condoms, and on the relative proportions of direct and indirect costs, to arrive at overall condom costs. We combined this information to estimate the total cost per CYP of both types of condom use (since DHS data does not distinguish between male and female condom use). Note that imports of male and female condoms (see cell M14, IntCost) gives a higher proportion for female condoms than does actual use (see cell J168, IntCost). We preferred to use data on actual use than on importation.

Estimates of Budget (2010–2015) for Family Planning

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[3] These references are to the Version 1 model (the Cameroon analysis was run on both versions and served to test the new version of the model).

[4] AIU3 = *Adding It Up*, 3rd edition. See Guttmacher.org for various publications related to the *Adding It Up* project.

Worksheet: IntCost; Rows: 250-317; Variables: C04, C05[5]

Even though budget figures are not expenditures, budgets are an indication of how expenditures will be shared among various cost components. The outputs of the calculations and adjustments are in cells J254–L263. Budget items refer to different time periods, so we calculated <u>annual</u> amounts (column I). We assumed that the actual cost of commodities is implied in Table 17 as the residual between the given total and the actual total.

Estimate of Costs of Contraceptive Services

Worksheet: INT4-Cost; Variable: C01

•**Oral pills and IUDs**: The full cost per CYP was taken directly from two nongovernmental organization family planning programs for which the total program costs and the number of units of each contraceptive method distributed were known. Estimates of the time taken for consultations for each method were also available.

•**Injectables, implants and condoms**: Costs were estimated as above, but the combined categories "implants/injectables" and "male/female condoms" were arrived at by weighting the costs according to the number of each device imported in 2012. See cells L99–S102 (Version 1).

•**Other supply methods**: Since these methods account for a very small proportion of total contraceptive use in Cameroon, and since no specific data on their costs were available, we used the simple average of the costs per CYP of oral pills and condoms as a proxy for this cost.

•**Sterilizations**: No country-specific data are available in Cameroon. We used the AIU3 estimates of commodity costs and labor for both female and

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[5] References to Version 1.

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male sterilization.[6] To those we added the average noncommodity costs of implants and IUDs. The CYP conversion factor used was also taken from AIU3 (see variable R09 in the *IntOther* worksheet, Version 1).

III. MATERNAL AND NEWBORN HEALTH

Estimates of Cost of Normal Deliveries and Cesarean Deliveries

Worksheet: ORIG-Cost; Variables: P05, P18

Data from a Ministry of Health study on the costs of vaginal and cesarean deliveries (P05) were used to estimate the costs of the procedures. These costs seem to include only the direct costs of labor and materials. The study covers two areas, Maroua Urbain and Meskine. Weighted average costs for normal deliveries and cesarean deliveries were calculated using number of interventions as the weights.

Data from another Ministry of Health study on the cost of vaginal and cesarean deliveries (P18) were also used to estimate the costs of the procedures. The study covers two regions, Nord and Extreme-nord. Results are presented as ranges of costs (rows 517 and 535); we assumed that the mean value for closed ranges was the midpoint and the mean value for the two open ranges was a value 35% greater than the minimum value. Weighted average costs for normal deliveries and cesarean deliveries were then calculated (column F). Overall weighted averages across the two

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[6] Indirect costs (overhead and capital costs) were added here and elsewhere) using data on the share of total costs that were indirect in two PACCM studies in Uganda (68%) and Rwanda (49%). A simple average of the two studies was used to estimate indirect costs.

regions were also calculated (cells F507 and F525), using the number of women of reproductive ages as weights.

Estimate of Incidence of Postpartum Hemorrhage

Worksheet: IntDHS; Rows: 499-521; Variable: DHS20[7]

We found four studies that estimated the incidence rate of postpartum hemorrhage in Cameroon. None were national estimates. Since these studies covered health centers, district hospitals and major referral hospitals, we decided to use a simple average of the four estimates for our national estimate of this rate. The estimate is quite close to two further estimates from countries nearby Cameroon. Since we have no regional-level information, we made the assumption that the national rate is the same in all regions of Cameroon.

Estimate of Incidence of Puerperal Sepsis

Worksheet: IntDHS; Rows: 525-547; Variable: DHS21[8]

We identified only one study that estimated the incidence rate of puerperal sepsis in Cameroon. It was not a national estimate. We also found two estimates from outside Cameroon. We decided to use a simple average of the three available estimates for our national estimate of this rate. Since we have no regional-level information, we assumed that the national rate is the same in all regions.

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[7] References to Version 1.

[8] References to Version 1.

Estimate of Incidence of Eclampsia/Preeclampsia

Worksheet: IntDHS; Rows: 551-573; Variable: DHS22[9]

Five studies have estimated the incidence rate of eclampsia/pre-eclampsia in Cameroon. None were national estimates. Since these studies covered health centers, district hospitals and major referral hospitals, we decided to use a simple average of the five estimates for our national estimate of this rate. The estimate is quite close to two further estimates from outside Cameroon. Since we have no regional-level information, we made the assumption that the national rate is the same in all regions.

Estimates of Budget (2010–2015) for MNH

Worksheet: IntCost; Rows: 320-403; Variable: C06[10]

As noted earlier, although budget figures are not expenditures, budgets are an indication of how expenditures will be shared among various cost components. The outputs of the calculations and adjustments are in cells K324–M332. Budget items refer to different time periods, so we calculated <u>annual</u> amounts (column I). The main useful output from these calculations is the share of the budget for overhead and capital (cells N326–O326), since purchase of supplies and labor inputs are not included in Table 8.

Estimate of Costs of MNH Services

Worksheet: INT4-Cost; Variable: C01

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[9] References to Version 1.

[10] References to Version 1.

•**Antenatal care**: The only available data source was AIU3, which had information on direct costs (basic antenatal care plus anemia screening). For indirect costs, see footnote 6.

•**Normal deliveries**: Data from four country sources were available as well as AIU3 estimates. A simple average of the five sources was used. For indirect costs, see footnote 6.

•**Cesarean sections**: Data from five country sources were available, as were AIU3 estimates; however, we excluded the United Nations Population Fund data, which duplicated data from another source. A simple average of the remaining five sources was used. One source had separate semi-urban and rural estimates. These two were combined as a weighted average using United Nations estimates of the rural and urban populations in Cameroon. For indirect costs, see footnote 6.

•**Other MNH interventions**: For iron and folic acid supplements, tetanus vaccination, postpartum hemorrhage, puerperal sespsis, eclampsia, postpartum checkup, routine newborn care and postabortion care, the only data source was AIU3, which had information on direct costs (basic antenatal care plus anemia screening). For indirect costs, see footnote 6.

IV. OTHER

Estimates of DALYs

Worksheet: ORIG-Demographic; Variables: VAR105, VAR109, VAR113

Country-level estimates of DALYs are available only for the year 2004. The latest global estimates are for the year 2010. We estimated Cameroon DALYs for 2010 by adjusting the 2004 estimates by the factor (*Total Global DALYs 2010 / Total Global DALYs 2004*). This was done for *All Maternal Disorders* and *All Newborn Disorders*. Then, DALYs for specific maternal or newborn disorders were estimated by using the 2010 distribution of disorders. (Note that the Global Burden of Disease terminology has changed: "Perinatal" is now "neonatal"; we treated "other perinatal conditions" to be the sum of "sepsis and other infectious disorders of the newborn baby" and "other neonatal disorders"; and "low-birth weight" is equivalent to "preterm birth complications".) More information on the Global Burden of Disease study is available at http://www.who.int/healthinfo/global_burden_disease/about/en/

What the Macro for Table OUT3N Does

Worksheet: OUT3-Contraceptive Mix

The cells in table OUT3N are calculated as the product of *number of users* x *adjusted failure rates*. That is the first step. However, the results still do not match Table OUT3M because some adjusted failure rates were arbitrarily set to 85% (as an upper limit). Thus the second step is to adjust the numbers from the first step to match OUT3M. This is done by calculating the totals by region and then a ratio for each region. Next, each failure rate is multiplied by the appropriate ratio. The same procedure is done for the wealth quintiles.

What the Macro "CheckUsers" Does

Worksheet: OUT3-Contraceptive Mix

This macro checks for the rare, but possible, condition in which a particular region has zero users of modern contraceptive methods. In such cases, scenarios 3 and 4 become problematic, because new users are apportioned to the various modern methods according to the current use pattern; if there are no current users, there is no pattern to follow. In case there are no modern users currently, the macro uses the all-region totals to derive the method use (method mix) pattern.

What the Macro "Approximation" Does

Worksheet: OUT5-Births and Abortions

This macro adjusts calculations for Table OUT-5A. The three panels of this table (All Women, Women not in Union, and Women in Union) are estimated from DHS data, separately for each panel. For this reason, the two subpanels (Women not in Union and Women in Union) generally do not sum exactly to the main panel (All Women). The macro uses a numerical analysis technique to make row totals and column totals be consistent. An iterative process is used; the macro makes eight iterations. The final estimates are found in Table OUT-5C. The original estimates are found in Table OUT-5Ca, to the right of Table OUT-5C. Although row and column totals are consistent (the subpanels sum to the main panel), the individual cells are not consistent.