



Allocate

Version 1

**A Computer Program to Improve
Priority Setting and Resource Allocation
for Reproductive Health**

Spectrum System of
Policy Models

By Lori Bollinger
Futures Group, a Constella company





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I. Introduction

A. Description of the Spectrum System

1. Components

The POLICY Project and its predecessor projects have developed computer models¹ that analyze existing information to determine the future consequences of today's population programs and policies. The new Spectrum Policy Modeling System consolidates previous models into an integrated package containing the following components:

- **Demography (DemProj)** – A program to make population projections based on (1) the current population, and (2) fertility, mortality, and migration rates for a country or region.
- **Family Planning (FamPlan)** – A program to project family planning requirements in order for consumers and/or nations to reach their goals of contraceptive practice or desired fertility. This model also includes the Post-abortion Care module, or PAC, which examines the costs of providing post-abortion care and the resulting impact on the maternal mortality ratio.
- **Benefit-Cost** – A program for comparing the costs of implementing family planning programs, along with the benefits generated by those programs.
- **AIDS (AIDS Impact Model – AIM)** – A program to project the consequences of the AIDS epidemic.
- **Condom Requirements (CR)** – A program to forecast national condom requirements for both family planning and HIV/AIDS prevention, focusing on the critical groups at risk in the population.
- **Socioeconomic Impacts of High Fertility and Population Growth (RAPID)** – A program to project the social and economic consequences of high fertility and rapid population growth for sectors such as labor force, education, health, urbanization and agriculture.

Spectrum consolidates DemProj, FamPlan (including PAC), Benefit-Cost, AIM, CR, RAPID, SMM, and PMTCT models into an integrated package.

¹ The terms "model" and "module" are used interchangeably in the Spectrum manuals to refer to the computer programs within the system.

- **Safe Motherhood Model (SMM)** – A program to assist in allocating effectively the resources associated with reducing the maternal mortality ratio.
- **Prevention of Mother-to-Child Transmission (PMTCT)** – A program to evaluate the costs and benefits of programs to reduce mother-to-child transmission of HIV.

2. Software Description

Spectrum is a Windows-based system of integrated policy models. The integration is based on DemProj, which is used to create the population projections that support many of the calculations in the other components—FamPlan, Benefit-Cost, AIM, CR, RAPID, SMM, and PMTCT.

Each component has a similarly functioning interface that is easy to learn and to use. With little guidance, anyone who has a basic familiarity with Windows software will readily be able to navigate the models to create population projections and to estimate resource and infrastructure requirements. The accompanying manuals contain both instructions for users and equations for persons who want to know exactly how the underlying calculations are computed.

B. Uses of Spectrum Policy Models

Policy models are designed to answer a number of “what if” questions. The “what if” refers to factors that can be changed or influenced by public policy.

Policy models are designed to answer a number of “what if” questions relevant to entities as small as local providers of primary health care services and as large as international development assistance agencies. The “what if” refers to factors that can be changed or influenced by public policy.

Models are commonly computerized when analysts need to see the likely result of two or more forces that might be brought to bear on an outcome, such as a population’s illness level or its degree of urbanization. Whenever at least three variables are involved (such as two forces and one outcome), a computerized model can both reduce the burden of manipulating those variables and present the results in an accessible way. Some of the policy issues commonly addressed by the Spectrum set of models include:

- the utility of taking actions earlier rather than later. Modeling shows that little in a country stands still while policy decisions are stalled and that many negative outcomes can accumulate during a period of policy stasis.

A set of policies under consideration may not be acceptable to all stakeholders.

- the evaluation of the costs vs. the benefits of a course of actions. Modeling can show the economic efficiency of a set of actions (i.e., whether certain outcomes are achieved more effectively than under a different set of actions), or simply whether the cost of a single set of actions is acceptable for the benefits gained.
- the recognition of interrelatedness. Modeling can show how making a change in one area of population dynamics (such as migration rates) may necessitate changes in a number of other areas (such as marriage rates, timing of childbearing, etc.).
- the need to discard monolithic explanations and policy initiatives. Modeling can demonstrate that simplistic explanations may bear little relationship to how the “real world” operates.
- the utility of “door openers.” A set of policies under consideration may not be acceptable to all stakeholders. Modeling can concentrate on favored goals and objectives and demonstrate how they are assisted by the proposed policies.
- that few things in life operate in a linear fashion. A straight line rarely describes social or physical behavior. Most particularly, population growth, being exponential, is so far from linear that its results are startling. Modeling shows that all social sectors based on the size of population groups are heavily influenced by the exponential nature of growth over time.
- that a population’s composition greatly influences its needs and its well being. How a population is composed—in terms of its age and sex distribution—has broad-ranging consequences for social welfare, crime rates, disease transmission, political stability, etc. Modeling demonstrates the degree to which a change in age and sex distribution can affect a range of social indicators.
- the effort required to “swim against the current.” A number of factors can make the success of a particular program harder to achieve; for example, the waning of breastfeeding in a population increases the need for contraceptive coverage. Modeling can illustrate the need for extra effort—even if simply to keep running in place.

C. Organization of the Manuals

Each manual begins with a discussion of what the model does and why someone would want to use it. The manual also explains the data decisions and assumptions needed before the model can be run, and possible sources for the data. It defines the data inputs and outputs. The manual contains a tutorial, information on the methodology behind the model, a glossary, and a bibliography.

D. Information about the POLICY Project

The POLICY Project is a USAID-funded activity designed to create a supportive environment for family planning and reproductive health programs through the promotion of a participatory process and population policies that respond to client needs. To achieve its purpose, the project addresses the full range of policies that support the expansion of family planning and other reproductive health services, including:

- national policies as expressed in laws and in official statements and documents;
- operational policies that govern the provision of services;
- policies affecting gender roles and the status of women; and
- policies in related sectors, such as health, education and the environment that affect populations.

The POLICY Project is implemented by the Futures Group in collaboration with Research Triangle Institute (RTI) and the Centre for Development and Population Activities (CEDPA).

More information about the Spectrum System of Policy Models and the POLICY Project is available from:

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Office of Population and Reproductive Health
1300 Pennsylvania Avenue, NW
Washington, DC 20523 U.S.A.
Telephone: (202) 712-5787 or -5839

E. What Is *Allocate*?

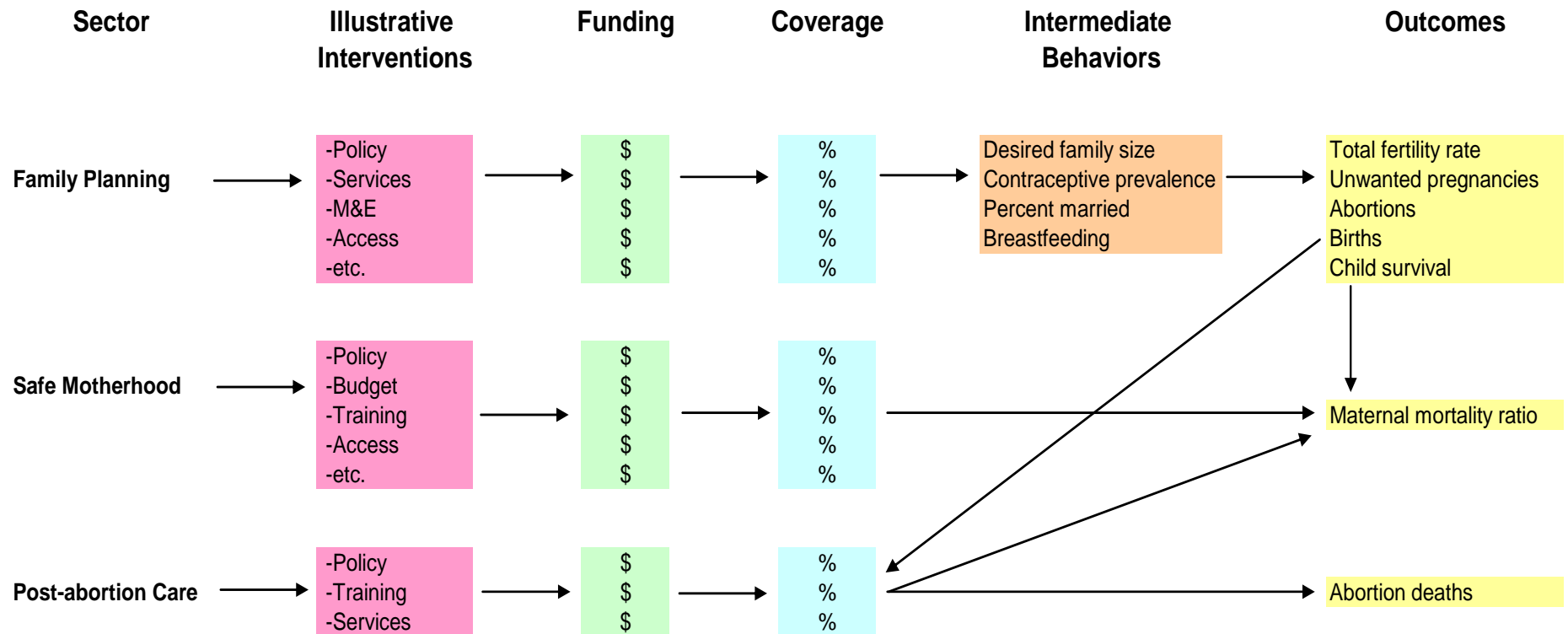
Planning for comprehensive reproductive health programs has been hampered by a lack of tools to relate program actions to goals. Although most countries have developed or are developing reproductive health action plans (RHAP), there are many challenges to this work. Some of the biggest challenges are how to answer the following questions:

- How much funding is required to achieve the goals of the RHAP?
- What goals are feasible (for indicators such as unintended pregnancies, maternal mortality ratio, abortions)?
- How should we allocate the available resources to best achieve these goals?

Allocate is a tool that can be used to answer some of these questions. It examines the linkages and interactions between three main areas of a representative RHAP: family planning, safe motherhood, and post-abortion care. It summarizes output from other Spectrum models on one summary screen. *Allocate* then provides a mechanism to re-allocate and/or increase budgets for each of the various models, with resultant impacts shown on the summary screen.

A general schematic of *Allocate* can be seen in Figure 1 below. Funding levels for various interventions in the three areas are determined, based on data and policy assumptions. These funding levels in turn determine the coverage levels for relevant populations (e.g., percentage of pregnant women receiving antenatal care). Outcomes will vary, depending on the focus of the funding. The purpose of *Allocate* is to show the interactive impacts of changing decisions about levels of funding. For example, if more money is budgeted for family planning, unmet need decreases, and the number of births will also decrease in the family planning sector. In addition, however, a decrease in the number of births will decrease the number of maternal deaths, simply because there are fewer births in general. It is this type of interactive effect that *Allocate* examines.

Resource Allocation for Reproductive Health Action Plans



Note: There is no separate component for adolescents. They will be examined separately within each component.

This process is performed on an aggregate level for the various models, i.e., the changes that are specified in the *Allocate* summary sheet are assumed to be proportionally distributed within the individual models. Once an overall total budget is calculated, making changes within the individual models may result in an even more cost-effective allocation.

F. Why Use *Allocate*?

The *Allocate* model is intended to (1) support priority-setting dialogue by supporting improved reproductive health action plans, with increased efficiency in the use of funding resources, and (2) create a better dialogue between all stakeholders regarding reproductive health priorities.

The *Allocate* model does not provide all of the answers. It is intended to assist planners in understanding the effects of funding levels and allocation patterns on program impact. The model can help planners understand how funding levels and patterns can lead to reductions in maternal mortality, abortion-related deaths, child mortality, unintended pregnancies, and increases in contraceptive prevalence. It does not, however, calculate the “optimum” allocation pattern or recommend a specific allocation of resources between interventions.

The *Allocate* model is intended for use by national programs to explore the effects of different funding levels and patterns on national goals and RHAP targets. It is generally implemented by a multi-disciplinary team composed of participants with various areas of expertise (demography, epidemiology, health finance, planning) representing different aspects of society (government, civil society, private sector, donors). A technical team works together to implement the model for the first time. The model is then used in interactive workshops with planners and stakeholders to explore the effects of different program configurations on health outcomes. Through this interaction participants gain a better understanding of the dynamics of funding and impact. This prepares them to develop realistic budgets and goals that reflect their priorities.

II.

Steps in Implementing *Allocate*

Three modules of Spectrum must be completed in order to utilize the *Allocate* summary screen: DemProj, FamPlan, and SMM.² Within FamPlan, both the Post-abortion Care (PAC) and Child Survival (CS) sub-modules need to be implemented in order to provide relevant inputs to *Allocate*. Complete descriptions of these three modules, and the process of applying them, can be found in the individual manuals for each of the modules at:

<http://www.futuresgroup.com/>

Select “Quick Link to Free Software” from the right-hand side of the web page, and then “Spectrum” in order to access the manuals and to download the Spectrum software.

In general, there are five key steps in making projections using Spectrum. The amount of time spent on each step may vary, depending on the application, but most projection activities will include at least these five steps.

1. **Collect data.** Information on data to make population projections, family planning method and source mix, post-abortion care, child survival, maternal health, and various costing elements are all necessary for *Allocate*. Complete details are given in each of the relevant manuals.
2. **Make assumptions.** Each of the modules has assumptions associated with it that must be made. For example, in FamPlan, assumptions about the future levels of family planning and method mix are necessary. Full descriptions of the necessary assumptions can be found in each manual.
3. **Enter data.** Once the data are collected and decisions made about projection assumptions, the data must be entered into the Spectrum program.

² In the current Excel version of *Allocate*, only DemProj and FamPlan need to be completed in Spectrum. The SMM is part of the Excel version of *Allocate*, and must be completed in Excel.

4. **Examine projections.** Once the projection is made, it is important to examine the outputs carefully. Careful examination of these indicators can act as a check to ensure that the data and assumptions were understood and entered correctly into the computer program. This careful examination is also required to ensure that the consequences of the assumptions are fully understood.
5. **Make alternative projections.** Many applications require alternative projections. Once the base projection has been made, the program can be used to quickly generate alternative projections as the result of varying one or several of the model assumptions.

III.

Inputs for *Allocate*

As discussed above, three different Spectrum modules must be completed in order to implement *Allocate*: DemProj, SMM, and FamPlan (including the PAC and CS components). This chapter will highlight important details that are relevant in setting up the models for an *Allocate* application; thorough details for completing each of these modules can be found in their respective manuals. The details that will be highlighted are both the general data requirements and the key input assumptions that are required to achieve the appropriate outputs for *Allocate*.

A. DemProj

Data requirements for DemProj include:

- Base year population
- Fertility data
- Mortality data
- International migration data
- Current population for both urban and rural settings (if so desired)

For some of the required variables, default values are provided, such as for patterns of age-specific fertility rates, model life tables, and the sex ratio at birth.

Note that, instead of following the process above, it is possible to utilize a feature in DemProj called “EasyProj.” EasyProj uses the data from the most recently available United Nations population projections to provide default values for all of the data necessary to make a demographic projection for a particular country, using either the low, medium, or high projection assumptions as published by the United Nations *World Population Prospects*. Country-specific default assumptions provided by EasyProj include base year population, fertility data (including age-specific fertility rates), mortality data, and international migration data. Details of using “EasyProj” are contained in the DemProj manual.

Another alternative is to begin with the “EasyProj” default projection values, and then edit selected assumptions as necessary.

B. SMM (Safe Motherhood Model)

Data requirements for the SMM include:

- Scores from a recent Maternal and Neonatal Program Effort Index (MNPI)
- Unit costs for various service-delivery interventions, based either on implementing the World Health Organization’s (WHO) Mother-Baby Costing Package (MBP), or from some other data source containing cost information
- Other expenditures on maternal health-related activities, such as policy efforts and general training, usually available from strategic plans
- Other socioeconomic variables such as primary enrollment rates.

Default values for some of these variables at the national level exist in Spectrum; these values can either be accepted or overwritten. Further details of the specific data requirements and possible default values are available in the SMM manual. Note that the default values are at the national level; if the model is to be applied at a level other than the national level, different values must be entered.

In addition, note that, in order to calculate the appropriate outputs for *Allocate*, it is necessary to select the “Budget” option on the SMM “Setup” tab, rather than the “Score” option. Also, to ensure that the different modules are using the same scales and currency, make sure that the scales for DemProj and SMM agree, that is, both are set to either “Units,” “Thousands,” or “Millions,” and that the same currency is selected for both modules. In DemProj, the scale applies to population, while in SMM, the scale applies to costs; they need to be the same in order for total expenditures to be calculated correctly. Note that the scale for the FamPlan module (including PAC and CS) is always in units.

C. FamPlan

There are three different sets of data and assumptions that are necessary to link up FamPlan with the *Allocate* summary sheet: those associated with the family planning portion of the FamPlan module, those necessary for the PAC sub-module, and those for the CS sub-module.

Family planning

Data required to implement the family planning portion of the FamPlan module include:

- data describing the use of family planning in the country being studied
- data about the use, effectiveness, and costs of the different contraceptive methods and services.

The FamPlan manual contains detailed information about both the data required and possible data sources. Note that the data describing family planning in the country must be specific to the country and are generally available from Demographic and Health Surveys, or similar surveys. Default international values for other variables may be used, such as for method effectiveness, as described in the manual. Finally, an advantage of implementing the SMM, which includes calculation of costs by completing the WHO Mother-Baby Package, is that unit costs for family planning are one of the variables calculated by the SMM. These unit costs should be used in providing the FamPlan unit cost assumptions on both product and service delivery, in order to provide consistency in the *Allocate* application.

Various key assumptions are necessary in constructing a FamPlan application, as specified on the "Configuration" screen in FamPlan. Two of these assumptions, the goal option and the abortion option, must have specific values in order for the PAC module to run correctly. For the goal option, "Reducing unmet need for contraception" must be selected on the "Configuration" screen. In addition, "Calculate from unintended pregnancies" must be selected under the abortion option on this same screen.

PAC (Post-abortion Care)

Data requirements for the PAC sub-module include various abortion-related statistics:

- percent of abortions that are legal
- percent of abortions that need treatment
- percent of all maternal deaths due to abortions
- relative risk of mortality for untreated vs. treated abortions
- unit costs and total expenditures for post-abortion care, including family planning costs

Many of these data are difficult to obtain; extensive tables of available data for various countries are published in the FamPlan manual, as well as suggested sources for further consultation.

As noted above, two options must be specified on the "Configuration" screen in FamPlan, in order for the PAC sub-module to function: reducing unmet need as the goal, and having abortions calculated from unintended pregnancies. In addition, PAC draws information on the current Maternal Mortality Ratio (MMR) from the SMM, and obtains information regarding the percent of unintended pregnancies that terminate in abortion from the "Proximate Determinants" screen in FamPlan. Changes to either of these assumptions for the PAC application, if necessary, need to be made to the relevant input screen.

CS (Child Survival)

Most data requirements and assumptions used to calculate changes in child survival are already provided by various modules of Spectrum. One additional variable that needs to be provided is the percent of births with any risk in the base year.

IV. Projection Outputs

There are four different graphs on the *Allocate* summary screen, one for each of the four main areas of analysis in the module: family planning, post-abortion care, safe motherhood, and child survival. Each of the four graphs can display different indicators in order to examine the impact of resource allocation decisions:

Family planning

- **Total fertility rate (TFR).** The average number of children that would be born to a cohort of women who survive until age 50 and have births according to the prevailing age-specific birth rates.
- **Contraceptive prevalence rate (CPR).** The percentage of married women of reproductive age using some form of contraception.
- **Unintended pregnancies.** The sum of both unwanted and mistimed pregnancies, which is equal to the number of births minus the number of wanted pregnancies. Unintended pregnancies are those that occur due to method failure, or those that occur to women who have an unmet need for limiting. Mistimed pregnancies are those that occur to women who have an unmet need for spacing.

Post-abortion care

- **Abortion-related deaths.** The number of maternal deaths that are a consequence of abortions, including deaths that are due to legal and illegal abortions, whether the abortions receive or do not receive treatment.
- **Number of abortions.** The total number of abortions in a specific year.

Safe motherhood

- **Number of maternal deaths.** The number of women who die from any cause related to or aggravated by pregnancy or its management during pregnancy and childbirth, or who die within 42 days of termination of pregnancy.
- **Maternal mortality ratio (MMR).** The number of maternal deaths per 100,000 live births.

Child survival

- **Infant mortality rate (IMR).** The number of deaths to infants under one year of age per 1,000 live births.
- **Under-five mortality rate (U5MR).** The number of deaths to children under the age of five per 1,000 live births.
- **Child deaths.** The number of deaths to children under the age of five.

V.

Program Tutorial

This tutorial covers the key steps in installing and running the Excel version of *Allocate*.³ It assumes that you have an IBM-compatible computer running Windows 95 or higher and that you are familiar with the basic operation of Windows programs and terminology.

A. Before You Get Started

First, you will need to run DemProj and FamPlan (including the PAC and CS sub-modules in FamPlan), both parts of the Spectrum system of policy models; please refer to their respective manuals for more information. Next, you will need to run the Safe Motherhood Model (SMM), which is currently part of the Excel version of *Allocate*. This model is documented here, as the Excel version of the SMM does not have a separate manual. Note that the WHO MBP is itself a separate model; complete documentation for the MBP model can be found at the website <http://www.who.int/reproductive-health/economics/intro.html>.

B. Running the Safe Motherhood Model in Excel

Three Excel workbooks are necessary to run the SMM, beginning with the workbook containing the *Allocate* model. The SMM is contained in the first four worksheets of the *Allocate* model, in the worksheets that are titled "Setup," "Score," "Budget," and "MMSIM35." The SMM also links to two other Excel workbooks that contain the World Health Organization's Mother-Baby Package (MBP), MBPCurr.xls and MBPStan.xls.

³ This version of the manual will describe a tutorial based on the Excel version of *Allocate*.

1. Starting the SMM

- a. Start Excel.
- b. Open the three files described above: the workbook containing the *Allocate* model and the two MBP workbooks. Note: when asked whether macros should be enabled, click on "Enable Macros" for all three workbooks.
- c. After the three files are open, make sure that they are linked appropriately. Select "Edit" from the program menu, and then select "Links." If the source file is not correct for the two MBP workbooks, select the "Change source..." button, and then scroll through the possible files until the correct one can be selected. Do this for both MBP workbooks.

2. Running the SMM

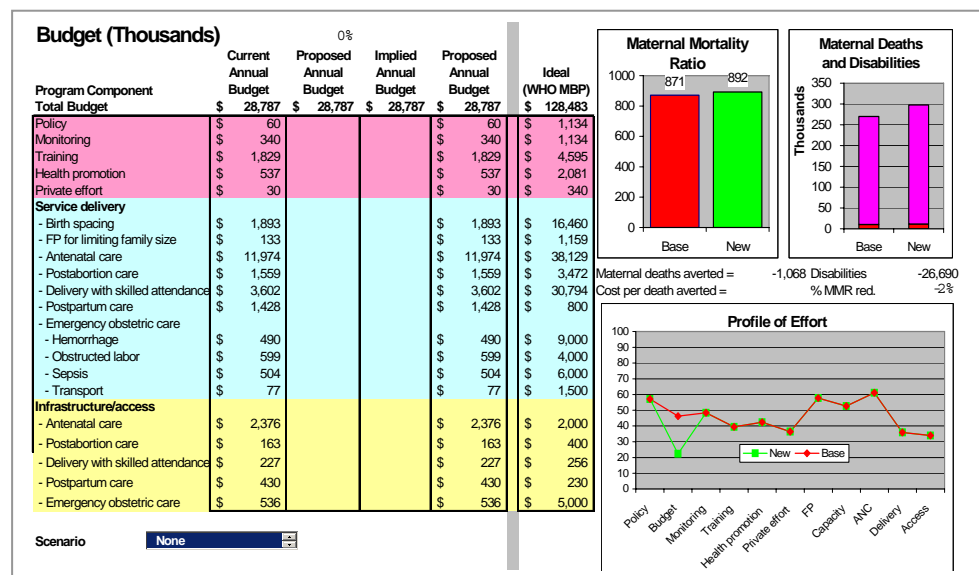
- a. There are primarily two worksheets to work with in the SMM for the application of the *Allocate* model: "Setup" and "Budget."
- b. Select the "Setup" worksheet. You will see something like the screen below, where the blue-highlighted cells are the ones to manipulate:

Safe Motherhood Model
Prepared by the POLICY Project
Based on the Maternal and Neonatal Program Effort Index,
the WHO Mother-Baby Package and the
MOH, DHS and ESOG
February 2004

Safe Motherhood Model Setup

Change Budget=1 or Score=2	1
Current maternal mortality ratio	871
Scale (1=units, 2=thousands)	2

- c. The first blue-highlighted cell should read "1," so that the model uses the budget option in its calculations.
- d. The current maternal mortality ratio (MMR) for the current country application should be entered into the second cell.
- e. The third cell specifies the scaling factor for the budget that is being examined. The scale can be set so that the expenditures are entered in as either units or in thousands of units of the specified currency. As discussed above, make sure that the currency and units in this model agree with the currency and units that are in the DemProj module.
- f. Select the "Budget" worksheet. You should see something like the following:



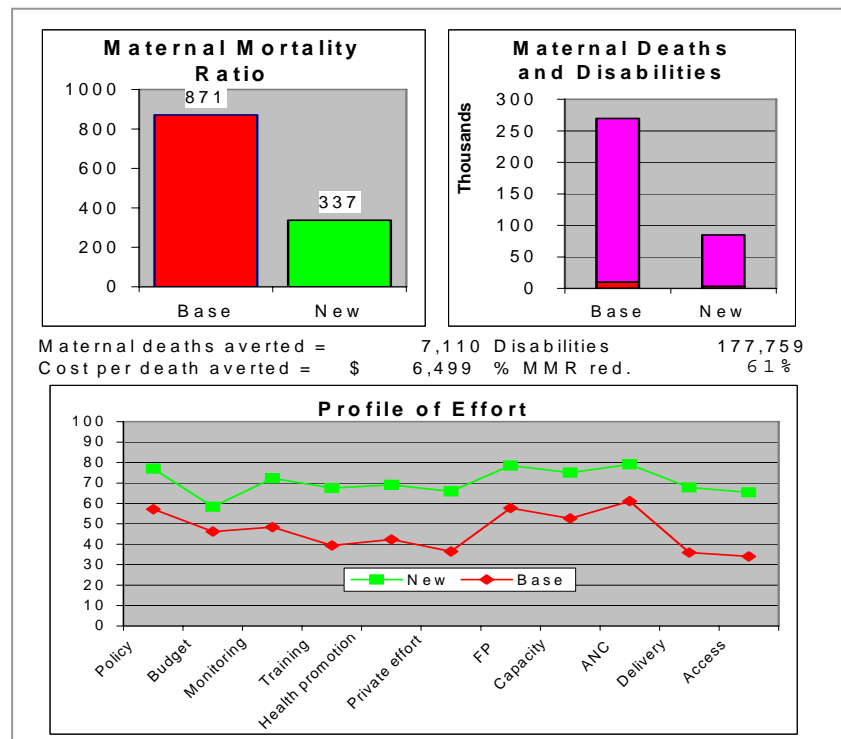
The first column lists the possible interventions that can be funded which have an impact on the MMR. The second column displays the estimated current expenditures in the initial year of the strategic plan, based on the results from the MBP and the current strategic plan. The third column is the one that you will use to change the proposed annual budget, which is set up to use the current annual budget as the default values.

The fourth column displays the implications for the overall budget after you make any desired changes to the proposed annual budget. The model is highly interactive, and so changing one line item, such as Policy, implies that there are changes in other line items, as well.

The fifth column reflects any changes that have been made. For example, if the amount devoted to Policy increases from 60 to 100, the new values in the first five columns in the initial line items would look like the following:

Program Component	0%			
	Current Annual Budget	Proposed Annual Budget	Implied Annual Budget	Proposed Annual Budget
Total Budget	\$ 28,787	\$ 29,374	\$ 29,379	\$ 29,374
Policy	\$ 60	\$ 100	\$ 100	\$ 100
Monitoring	\$ 340		\$ 359	\$ 359
Training	\$ 1,829		\$ 1,875	\$ 1,874
Health promotion	\$ 537		\$ 570	\$ 570
Private effort	\$ 30		\$ 33	\$ 30
Service delivery				
- Birth spacing	\$ 1,893		\$ 2,343	\$ 2,343
- FP for limiting family size	\$ 133			\$ 133
- Antenatal care	\$ 11,974			\$ 11,974
- Postabortion care	\$ 1,559			\$ 1,559
- Delivery with skilled attendance	\$ 3,602			\$ 3,602
- Postpartum care	\$ 1,428			\$ 1,428
- Emergency obstetric care				
- Hemorrhage	\$ 490			\$ 490

There are three sets of graphs that display the results of changing the expenditure levels in the SMM, as shown below:



The graph in the upper left quadrant displays the impact of the specified budget on the MMR, showing the base case on the left, and the new budget scenario on the right. The impact on the number of maternal deaths and disabilities is shown in the graph in the upper right quadrant, with the number of maternal deaths displayed in red for both the base case and the new budget scenario, and the number of maternal disabilities for each scenario shown in purple. The graph in the lower half of the area above indicates the impact of the increased budget in the base scenario on the various components of the MNPI.

Although it is useful to understand how to manipulate the SMM and see the resulting impact of an increased budget, when applying the Excel version of the *Allocate* model the only column that is necessary is the first column, the current budget. Any changes to the proposed budget are made within the "Allocate" worksheet, rather than directly in the "Budget" worksheet.

To summarize, the only setup that must be done with the Excel version of the SMM is to link the model to the two MBP workbooks, as described above, and to input the relevant information in the "Setup" worksheet.

C. Entering the Projection Assumptions from Spectrum

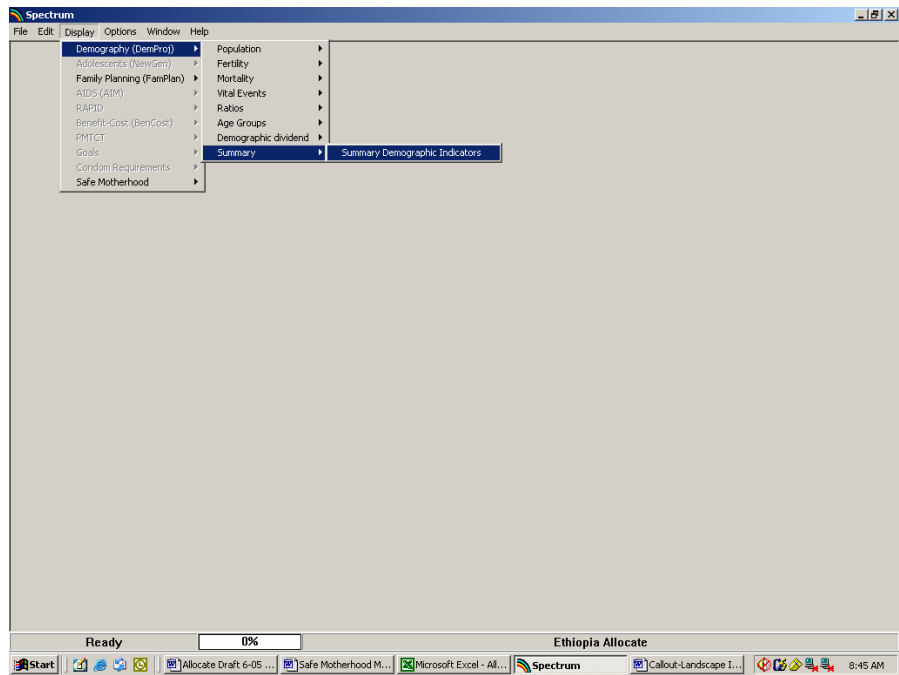
This section assumes that the DemProj and FamPlan (including PAC and CS) modules have been implemented in Spectrum, with the relevant years, currency, and scale of analysis properly specified. It also assumes a working knowledge of Spectrum and its editor; thorough documentation of the Spectrum modules and system itself can be found in the relevant manuals.

The *Allocate* model in Excel requires you to copy and paste various inputs from Spectrum into Excel. Briefly, the *Allocate* model is set up so that summary screens from Spectrum are used as the basis for the input, so that all you need to do is display the various summary screens, copy the entire summary screen, position the cursor appropriately in Excel, and then paste the entire contents of the editor into Excel. The process will be described below for each summary screen that is necessary.

Note that the following discussion assumes that the Spectrum program is open and running, and that the relevant scenario is also open within Spectrum. Recall from the inputs chapter of this manual that, in order for the PAC module to function, the “Reducing unmet need for contraception” goal must be selected in FamPlan, as well as the abortion option of calculating abortions from unintended pregnancies.

1. Assumptions from DemProj

While in Spectrum, select “Display” from the menu bar and then “Demography (DemProj)” from the pull-down menu. Continue by then selecting “Summary” from the pull-down menu, and finally “Summary Demographic Indicators”:



A screen like the one shown below will appear.

Configure - Summary Demographic Indicators

Region

Total

Urban

Rural

Sex

Both

Male

Female

Display Interval

Single year

Five Year

Ten Year

Chart Type

Summary Table

Final year

2015

Scale table values

Ok **Cancel**

Maintain the options of a single year display interval and of the default final year, which is in fact the actual final year of the scenario. Depending on whether the scaling factor is being used or not, either allow the checkmark to remain in the box for scaling table values, or click on the checkmark to turn scaling off. Then click on the "Ok" button in the lower left-hand corner of the screen.

The following screen will appear:

Spectrum

File Edit Display Options Window Help

Summary Demographic Indicators - Total

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Ethiopia PAC Trial												
Fertility												
Input TFR	5.90	5.83	5.77	5.71	5.65	5.59	5.53	5.47	5.41	5.35	5.29	5.23
GRR	2.88	2.84	2.81	2.79	2.76	2.73	2.70	2.67	2.64	2.61	2.58	2.55
NRR	2.10	2.09	2.09	2.08	2.07	2.07	2.06	2.05	2.04	2.03	2.02	2.00
Mean Age of Childbearing	29.2	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8
Child-woman ratio	0.80	0.78	0.76	0.74	0.72	0.70	0.70	0.70	0.69	0.69	0.68	0.68
Fertility table: Custom												
Mortality												
Male LE	50.0	50.4	50.8	51.2	51.6	52.0	52.4	52.8	53.2	53.6	54.0	54.4
Female LE	50.8	51.3	51.8	52.3	52.7	53.1	53.5	53.9	54.3	54.7	55.1	55.5
Total LE	50.4	50.9	51.3	51.8	52.2	52.6	53.0	53.4	53.8	54.1	54.5	54.9
IMR	118.2	115.8	113.3	111.0	108.8	106.7	104.6	102.5	100.5	98.4	96.3	94.3
USMR	174.9	170.9	166.9	163.1	159.5	156.0	152.7	149.3	145.9	142.6	139.3	136.1
Life table: Coale-Demeny West												
Immigration												
Male immigration	0	0	0	0	0	0	0	0	0	0	0	0
Female immigration	0	0	0	0	0	0	0	0	0	0	0	0
Total immigration	0	0	0	0	0	0	0	0	0	0	0	0
Vital Rates												
CBR per 1000	40.7	40.5	40.3	40.1	39.9	39.7	39.6	39.4	39.2	39.0	38.8	38.6
CDR per 1000	15.3	14.9	14.6	14.3	14.0	13.7	13.5	13.2	13.0	12.7	12.5	12.2
RNI percent	2.54	2.55	2.57	2.58	2.59	2.60	2.61	2.62	2.62	2.63	2.63	2.64
GR percent	2.54	2.55	2.57	2.58	2.59	2.60	2.61	2.62	2.62	2.63	2.63	2.64
Doubling time	27.6	27.5	27.3	27.2	27.1	27.0	26.9	26.8	26.8	26.7	26.7	26.6
Annual births and deaths (Millions)												
Births	2.67	2.72	2.78	2.84	2.91	2.97	3.04	3.10	3.17	3.24	3.31	3.38
Deaths	1.01	1.01	1.01	1.01	1.02	1.03	1.03	1.04	1.05	1.06	1.06	1.07
Population (Millions)												
Total population	65.59	67.31	69.08	70.92	72.80	74.75	76.75	78.81	80.94	83.12	85.37	87.69
Male population	32.53	33.42	34.34	35.29	36.27	37.27	38.31	39.37	40.47	41.60	42.76	43.95
Female population	33.06	33.88	34.74	35.63	36.54	37.48	38.45	39.44	40.47	41.53	42.62	43.73
Percent 0-4	17.99	17.61	17.24	16.88	16.55	16.32	16.30	16.28	16.26	16.24	16.22	16.19
Percent 5-14	27.95	28.06	28.15	28.21	28.25	28.20	27.95	27.70	27.45	27.19	26.92	26.66
Percent 15-40	44.63	44.90	45.10	45.41	45.73	46.02	46.33	46.61	46.80	47.18	47.48	47.73

Close **Configure** **Total - Male+Female**

Ready 0% Ethiopia Allocate

This is the summary screen from DemProj that must be copied and then pasted into the *Allocate* Excel workbook. To do this, first select “Edit” from the menu bar, and then select “Copy all.” Then, without closing the Spectrum program, move to the worksheet in the *Allocate* Excel workbook labeled, “DemProj outputs,” which will look like the screen below:

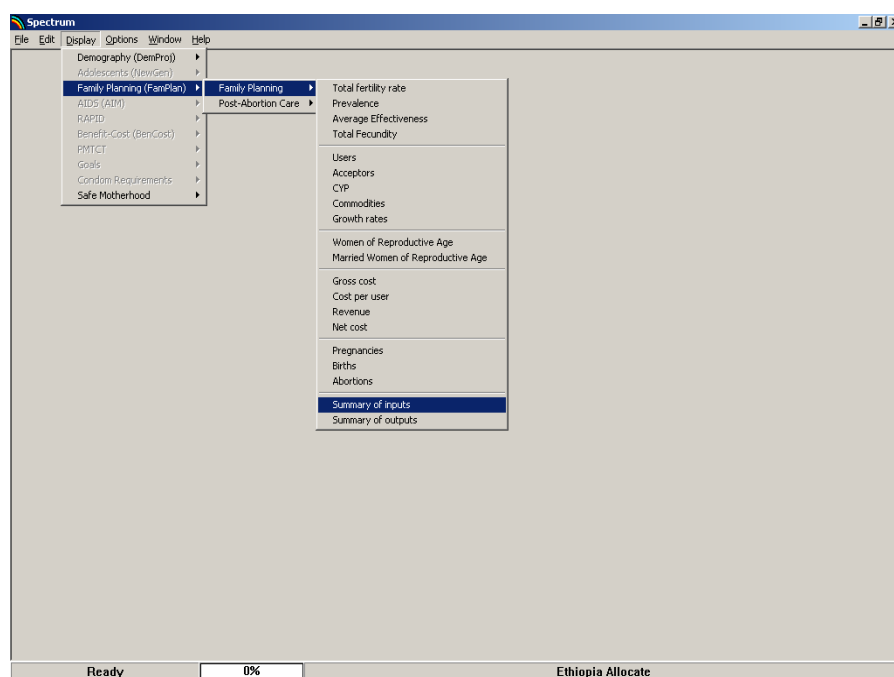
	2000	2001	2002	2003	2004	2005	2006
Summary Demographic Indicators - Total							
Fertility							
Input TFR	5.9	5.83	5.77	5.71	5.65	5.59	5.53
GRR	2.88	2.84	2.81	2.79	2.76	2.73	2.7
NRR	2.1	2.09	2.09	2.08	2.07	2.07	2.06
Mean Age of Childbearing	29.8	29.8	29.8	29.8	29.8	29.8	29.8
Child-woman ratio	0.8	0.78	0.76	0.74	0.72	0.7	0.7
Mortality							
Male LE	50	50.4	50.8	51.2	51.6	52	52.4
Female LE	50.8	51.3	51.8	52.3	52.7	53.1	53.5
Total LE	50.4	50.9	51.3	51.8	52.2	52.6	53
IMR	118.2	115.8	113.3	111	108.8	106.7	104.6
USMR	174.9	170.9	166.9	163.1	159.5	156	152.7
Vital Rates							
CBR per 1000	40.7	40.5	40.3	40.1	39.9	39.7	39.6
CDR per 1000	15.3	14.9	14.6	14.3	14	13.7	13.5
RNI percent	2.54	2.55	2.57	2.58	2.59	2.6	2.61
GR percent	2.54	2.55	2.57	2.58	2.59	2.6	2.61

In Excel, move the cursor to the top left-hand corner of the worksheet, cell A1, that reads “Summary Demographic Indicators – Total.” Then simply click on the paste command from the menu bar in Excel, and the copying will be complete.

2. Assumptions from FamPlan

A similar exercise to the one above must be performed for the FamPlan module as well. Instead of just one worksheet in the *Allocate* model to be filled in, however, there are three worksheets that need to be completed using information from the FamPlan module.

The first worksheet to be completed is the worksheet labeled “FamPlan inputs.” Return to the Spectrum program, select “Display” from the menu bar, and then select, in turn, “Family Planning (FamPlan),” “Family Planning,” and finally “Summary of inputs,” as shown below.



Again, maintain the default assumptions of displaying single years at a time and the final year value from the scenario. Then, after clicking on “Ok,” the following screen will be displayed.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Ethiopia PAC Trial											
Method Attributes											
Condoms/CYP	120	120	120	120	120	120	120	120	120	120	120
Female Ster. average age	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Injections/CYP	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
IUD duration of use (yrs)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Implant duration of use (yrs)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Pill cycles/CYP	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Effectiveness											
Condom	81	81	81	81	81	81	81	81	81	81	81
Female sterilization	100	100	100	100	100	100	100	100	100	100	100
Injectable	100	100	100	100	100	100	100	100	100	100	100
IUD	96	96	96	96	96	96	96	96	96	96	96
Implant	100	100	100	100	100	100	100	100	100	100	100
Pill	92	92	92	92	92	92	92	92	92	92	92
Traditional	50	50	50	50	50	50	50	50	50	50	50
Method Mix											
Spacing											
Condom	3.9	3.6	3.4	3.1	2.9	2.6	2.4	2.1	1.9	1.6	
Female sterilization	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Injectable	40.3	40.6	41.0	41.4	41.8	42.1	42.5	42.9	43.3	43.6	44.0
IUD	1.3	1.2	1.1	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.6
Implant	0.0	0.3	0.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	3.5
Pill	32.5	32.8	33.2	33.6	33.9	34.3	34.6	35.0	35.4	35.7	36.1
Traditional	22.1	21.3	20.6	19.8	19.1	18.4	17.6	16.9	16.1	15.4	14.7
Limiting											
Condom	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Female sterilization	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Injectable	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IUD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Implant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Traditional	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

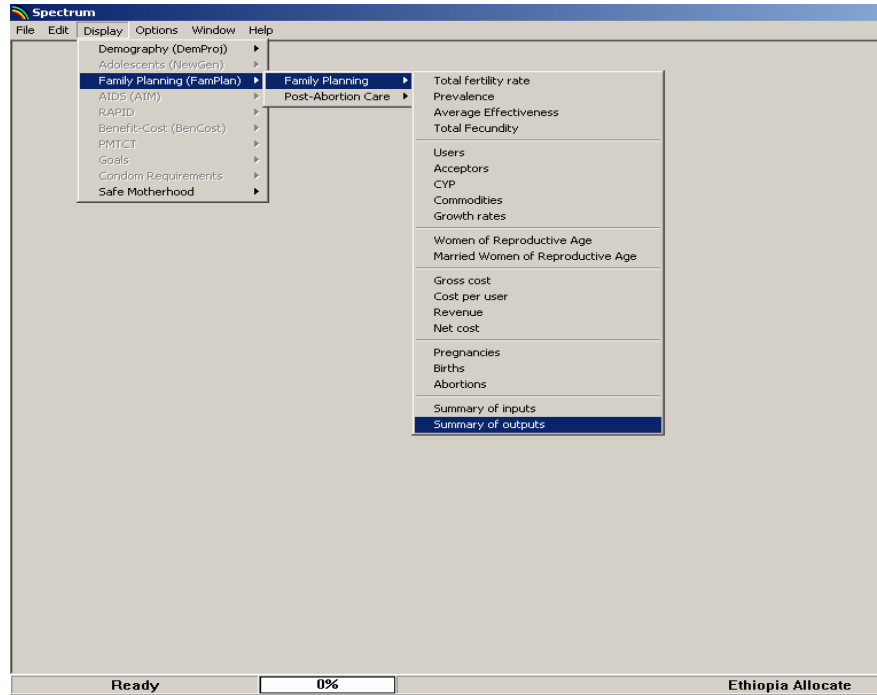
Once again, copy all of the summary input screen by first selecting "Edit" from the menu bar, then selecting "Copy all." At this point, move over to the *Allocate* Excel workbook and click on the worksheet tab labeled, "FamPlan inputs." It will look like the following screen:

	2000	2001	2002	2003	2004	2005	2006	2007
Ethiopia PAC Trial								
Method Attributes								
Condoms/CYP	120	120	120	120	120	120	120	120
Female Ster. average age	36	36	36	36	36	36	36	36
Injections/CYP	4	4	4	4	4	4	4	4
IUD duration of use (yrs)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Implant duration of use (yrs)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Pill cycles/CYP	15	15	15	15	15	15	15	15
Effectiveness								
Condom	81	81	81	81	81	81	81	81
Female sterilization	100	100	100	100	100	100	100	100
Injectable	100	100	100	100	100	100	100	100
IUD	96	96	96	96	96	96	96	96
Implant	100	100	100	100	100	100	100	100
Pill	92	92	92	92	92	92	92	92
Traditional	50	50	50	50	50	50	50	50
Method Mix								
Spacing								
Condom	3.9	3.6	3.4	3.1	2.9	2.6	2.4	2.1
Female sterilization	0	0	0	0	0	0	0	0
Injectable	40.3	40.6	41	41.4	41.8	42.1	42.5	42.9
IUD	1.3	1.2	1.1	1.1	1	0.9	0.8	0.7
Implant	0	0.3	0.7	1	1.4	1.7	2	2.4
Pill	32.5	32.8	33.2	33.6	33.9	34.3	34.6	35

Position the cursor at the top left-hand side of the worksheet, in cell A1, which contains the phrase, "Summary of inputs." Then select the "Paste" option from the menu bar, and the information from FamPlan will be pasted into the worksheet.

The second worksheet to be completed is the worksheet labeled "FamPlan outputs." There are two sets of results from FamPlan that need to be pasted into this worksheet.

The first set of results is the summary screen of outputs from FamPlan. Return to the Spectrum program, select "Display" from the menu bar, and then select, in turn, "Family Planning (FamPlan)," "Family Planning," and then this time, "Summary of outputs," as shown below.



The default values of single year display intervals and for the final year of analysis should be used again. If the scale needs to be changed, do so at this time by either keeping the box next to "Scale table values" checked, or clicking on the box to turn the checkmark off. Then click on "Ok" in the lower right-hand side of the screen. The following display will appear:

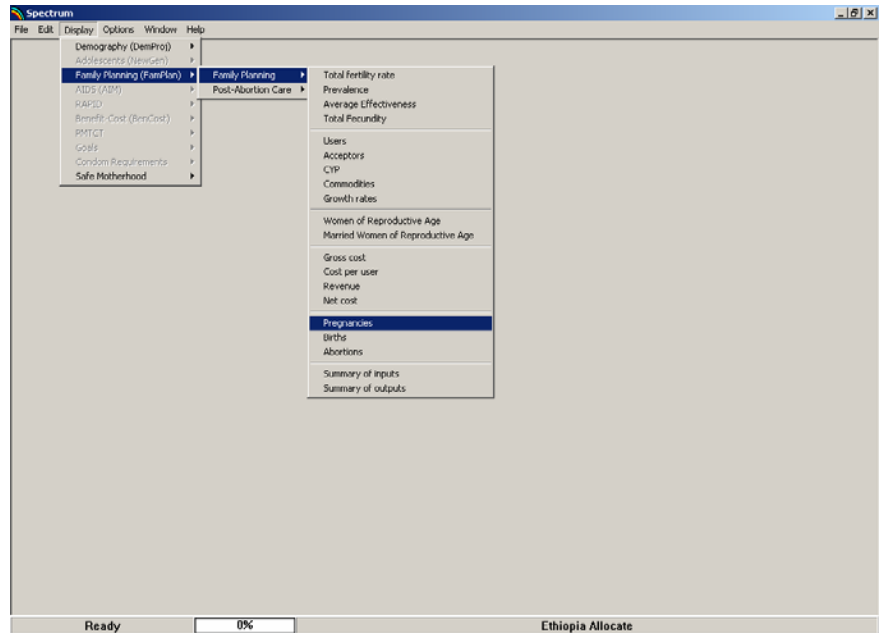
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Ethiopi															
Average	0.93	0.93	0.93	0.93	0.94	0.94	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0
Prevalence	8.10	9.34	10.58	11.81	13.05	14.29	15.53	16.76	18.00	19.24	20.48	21.71	22.95	24.19	25
Total Fe	5.90	5.83	5.77	5.71	5.65	5.59	5.53	5.47	5.41	5.35	5.29	5.23	5.17	5.11	5
Women	14.75	15.22	15.71	16.22	16.76	17.30	17.87	18.45	19.05	19.67	20.31	20.97	21.66	22.36	23
Married	9.40	9.69	10.01	10.33	10.67	11.02	11.38	11.75	12.13	12.53	12.94	13.36	13.80	14.24	14
Users of	0.76	0.91	1.06	1.22	1.39	1.57	1.77	1.97	2.18	2.41	2.65	2.90	3.17	3.44	3
Accepting	56.97	66.99	77.77	89.29	101.57	114.64	128.57	143.46	159.39	176.44	194.35	213.48	233.63	254.57	275
CYP of	1.04	1.20	1.37	1.55	1.74	1.95	2.17	2.40	2.64	2.90	3.18	3.47	3.78	4.10	4
Gross c	10.72	12.37	14.14	16.04	18.06	20.20	22.48	24.90	27.49	30.24	33.15	36.24	39.50	42.92	46
Cost pe	14.08	13.67	13.36	13.14	12.96	12.82	12.72	12.64	12.59	12.55	12.51	12.49	12.48	12.46	12
Revenue	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Net cost	10.72	12.37	14.14	16.04	18.06	20.20	22.48	24.90	27.49	30.24	33.15	36.24	39.50	42.92	46
Births f	2.67	2.72	2.78	2.84	2.91	2.97	3.04	3.10	3.17	3.24	3.31	3.38	3.45	3.53	3
Abortion	1.44	1.44	1.44	1.44	1.44	1.43	1.42	1.41	1.40	1.38	1.36	1.34	1.31	1.28	1
Pregnancy	6.37	6.43	6.50	6.57	6.64	6.71	6.77	6.82	6.87	6.92	6.96	6.99	7.02	7.04	7
Total Fe	21.53	21.53	21.53	21.53	21.53	21.53	21.53	21.53	21.53	21.53	21.53	21.53	21.53	21.53	21
Condom	3.43	3.63	3.79	3.92	4.00	4.03	4.01	3.92	3.77	3.55	3.26	2.87	2.40	1.83	1
Femal	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.15	0.16	0.17	0.19	0.20	0
Injec	1.18	1.35	1.53	1.72	1.93	2.15	2.39	2.64	2.91	3.19	3.50	3.82	4.17	4.53	4
IUD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Impla	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0
Pill	3.57	4.08	4.64	5.24	5.88	6.56	7.29	8.08	8.91	9.80	10.76	11.77	12.85	14.00	15
Trad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
26															
27															
28															
29															
30															
31															
32															
33															
34															

Copy the contents of this summary screen by selecting "Edit" from the menu bar, and then selecting "Copy all." When this is complete, move over to the *Allocate* Excel workbook and click on the worksheet tab labeled, "FamPlan outputs." It will look like the following screen:

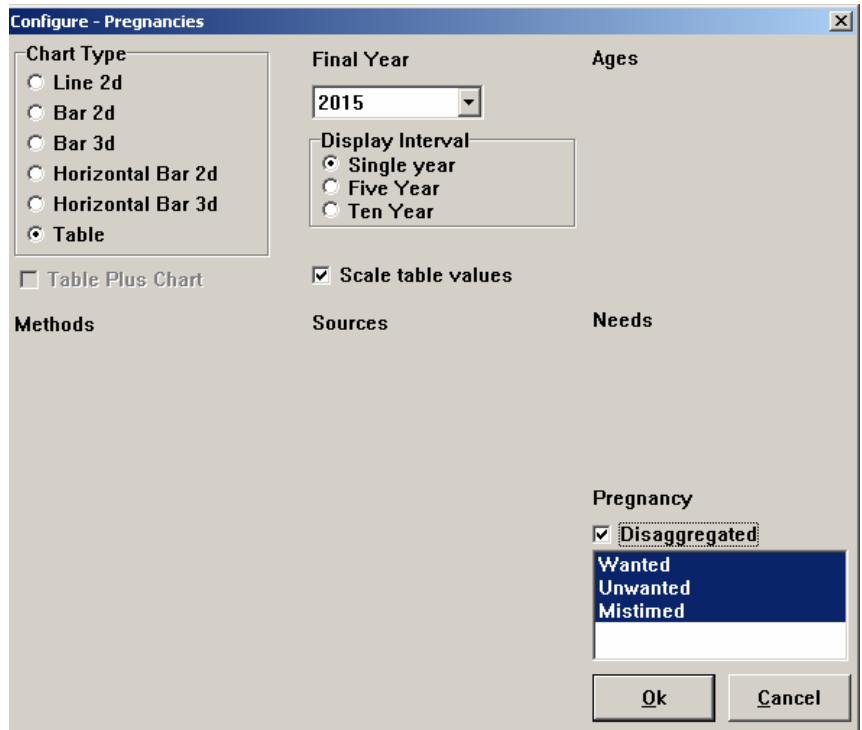
	2000	2001	2002	2003	2004	2005
Summary of outputs						
Ethiopia PAC Trial						
Average Effectiveness	0.93	0.93	0.93	0.93	0.94	0.94
Prevalence	8.1	9.34	10.58	11.81	13.05	14.29
Total fertility rate	5.9	5.83	5.77	5.71	5.65	5.59
Women of Reproductive Age (Millions)	14.75	15.22	15.71	16.22	16.76	17.3
Married Women of Reproductive Age (Millions)	9.4	9.69	10.01	10.33	10.67	11.02
Users (Millions)	0.76	0.91	1.06	1.22	1.39	1.57
Acceptors (Thousands)	56.97	66.99	77.77	89.29	101.57	114.64
CYP (Millions)	1.04	1.2	1.37	1.55	1.74	1.95
Gross cost (Millions)	10.72	12.37	14.14	16.04	18.06	20.2
Cost per user	14.08	13.67	13.36	13.14	12.96	12.82
Revenue	0	0	0	0	0	0
Net cost (Millions)	10.72	12.37	14.14	16.04	18.06	20.2
Births (Millions)	2.67	2.72	2.78	2.84	2.91	2.97
Abortions (Millions)	1.44	1.44	1.44	1.44	1.44	1.43
Pregnancies (Millions)	6.37	6.43	6.5	6.57	6.64	6.71
Total Fecundity	21.53	21.53	21.53	21.53	21.53	21.53
Commodities (Millions)						
Condom	3.43	3.63	3.79	3.92	4	4.03
Female sterilization	0.05	0.06	0.07	0.08	0.09	0.1
Injectable	1.18	1.35	1.53	1.72	1.93	2.15
IUD	0	0	0	0	0	0
Implent	0	0	0.01	0.01	0.01	0.01
Pill	3.57	4.08	4.64	5.24	5.88	6.56

Move the cursor to the top left-hand corner of the worksheet, cell A1, the cell that reads “Summary Demographic Indicators – Total.” Then simply click on the Paste command from the menu bar in Excel, and the copying will be complete.

The second set of results to be copied and pasted into the Excel worksheet “FamPlan outputs” is the data from FamPlan regarding types of pregnancies – unwanted, mistimed, and wanted. After returning to the Spectrum program, select “Display” from the menu bar, and then follow the screen shown below in order to display births: “Family Planning (FamPlan),” “Family Planning,” and then, “Pregnancies.”



The following screen will appear:



The final year of the scenario, as shown in the screen, should be used, as well as a display interval of single years. If the chart type is not set to "Table," click on the bullet next to the "Table" label to select it. After "Table" is selected, the different choices for "Pregnancy" will appear in the lower left-hand corner of the screen. Check the box next to "Disaggregated," so that each individual data series will be displayed. Finally, if the scaling factor needs to be toggled off, click on the box next to "Scale table values." The final screen should look like the screen above. Click on "Ok" to proceed, which will result in the following display:

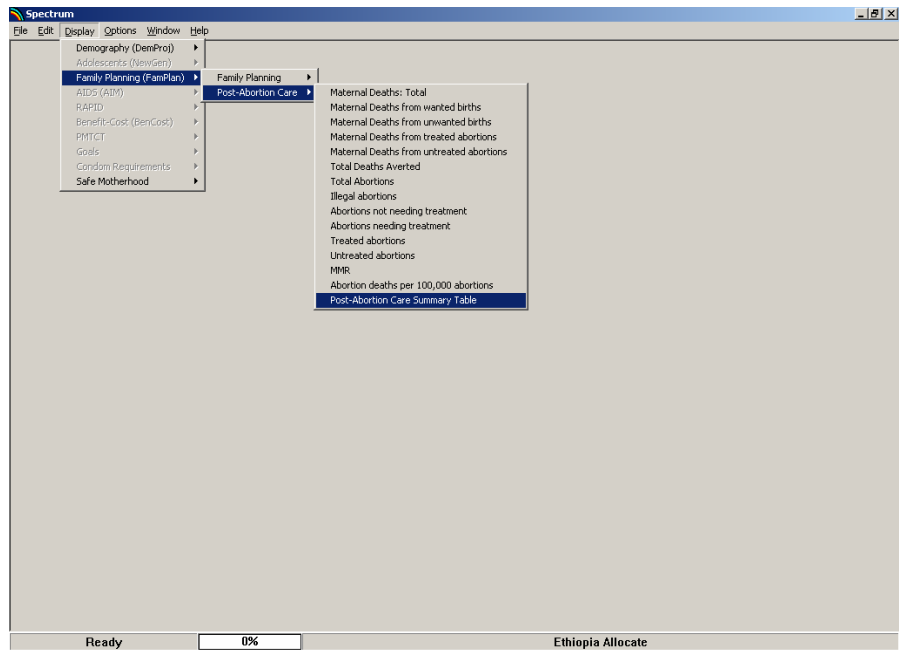
Ethiopia Allocate	Wasted	Unwanted	Mistimed	Total
2000	3.75	0.98	1.64	6.37
2001	3.81	0.98	1.65	6.43
2002	3.88	0.97	1.65	6.50
2003	3.96	0.97	1.65	6.57
2004	4.03	0.96	1.65	6.64
2005	4.11	0.95	1.65	6.71
2006	4.18	0.94	1.64	6.77
2007	4.26	0.93	1.63	6.82
2008	4.34	0.91	1.62	6.87
2009	4.41	0.90	1.61	6.92
2010	4.49	0.88	1.59	6.96
2011	4.56	0.86	1.57	6.99
2012	4.64	0.84	1.54	7.02
2013	4.71	0.82	1.51	7.04
2014	4.78	0.79	1.48	7.04
2015	4.84	0.76	1.43	7.03

At this point, place the contents of this screen into the editor by clicking on "Edit" from the menu bar, and then selecting "Copy all." After this is completed, move back over to the worksheet tab labeled, "FamPlan outputs" in the *Allocate* workbook. This time, move the cursor down to the cell in column A that contains the phrase, "Unintended pregnancies." It will be below the variables that were copied in from the FamPlan summary screen of outputs. The following screen should now be displayed:

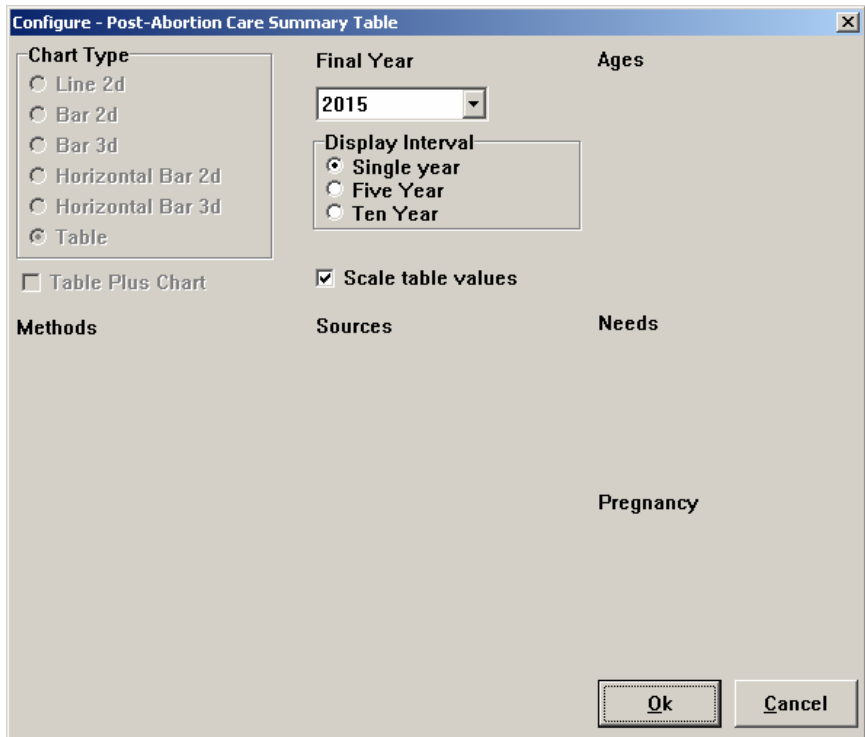
Summary of outputs							
	2000	2001	2002	2003	2004	2005	
Unwanted pregnancies	Wanted pregnancies		Births		Unwanted pregnancies		
	Ethiopia Allocate	Ethiopia Allocate	Ethiopia Allocate	Ethiopia Allocate	Ethiopia Allocate	Ethiopia Allocate	
2000	2,621,502	2000	3,747,147	2000	2,670,379	2000	1,...
2001	2,621,892	2001	3,812,519	2001	2,723,564	2001	1,...
2002	2,620,747	2002	3,884,049	2002	2,782,412	2002	1,...
2003	2,617,168	2003	3,957,615	2003	2,843,545	2003	1,...
2004	2,610,103	2004	4,032,259	2004	2,906,373	2004	1,...
2005	2,598,811	2005	4,107,574	2005	2,970,719	2005	1,...
2006	2,582,898	2006	4,183,507	2006	3,036,640	2006	1,...
2007	2,562,250	2007	4,259,910	2007	3,104,042	2007	1,...
2008	2,536,854	2008	4,336,554	2008	3,172,740	2008	1,...
2009	2,506,656	2009	4,413,062	2009	3,242,425	2009	1,...
2010	2,471,483	2010	4,489,148	2010	3,312,899	2010	1,...
2011	2,430,127	2011	4,563,575	2011	3,383,383	2011	1,...
2012	2,382,572	2012	4,636,720	2012	3,454,222	2012	1,...
2013	2,328,072	2013	4,708,172	2013	3,525,249	2013	1,...
2014	2,265,517	2014	4,776,939	2014	3,595,890	2014	1,...
2015	2,192,485	2015	4,839,914	2015	3,664,061	2015	1,...
Calculated CPR	8.1	9.2	10.4	11.8	13.3	15.1	
k	6.42						
Cc	0.92	0.91	0.90	0.88	0.86	0.85	

Select the "Paste" option from the Excel menu bar, and the editor will paste the values from Spectrum into Excel.

The final worksheet to be completed is the one related to the post-abortion care outputs from FamPlan. While in Spectrum, select "Display" from the menu bar, followed by selecting "Family Planning (FamPlan)" from the pull-down menu. At this point, results from the PAC sub-module can be displayed by then selecting "Post-abortion Care" from the pull-down menu, and finally "Post-abortion Care Summary Table," as shown on the screen below:



After completing the selection process, a screen like the one below will appear:



The final year to be displayed should again be the final year of the current scenario, and the display interval should remain at the single year option. If the table needs to be scaled appropriately, retain the checkmark in the box next to "Scale table values"; if not, then click on the box to turn that option off. Then click on the "Ok" box in the lower right-hand corner of the screen.

The following screen will appear:

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	20
Ethiopia PAC Total: Millions												
Maternal Deaths: Total	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
Maternal Deaths from wanted births	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	
Maternal Deaths from unwanted births	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Maternal Deaths from treated abortions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Maternal Deaths from untreated abortions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Abortions	1.44	1.44	1.44	1.44	1.44	1.43	1.42	1.41	1.40	1.38	1.36	
Illegal abortions	1.44	1.44	1.44	1.44	1.44	1.43	1.42	1.41	1.40	1.38	1.36	
Abortions not needing treatment	1.01	1.01	1.01	1.01	1.00	1.00	0.99	0.99	0.98	0.97	0.95	
Abortions needing treatment	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.42	0.42	0.41	0.41	
Treated abortions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Untreated abortions	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.42	0.42	0.41	0.41	
MMR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Abortion deaths per 100,000 abortions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

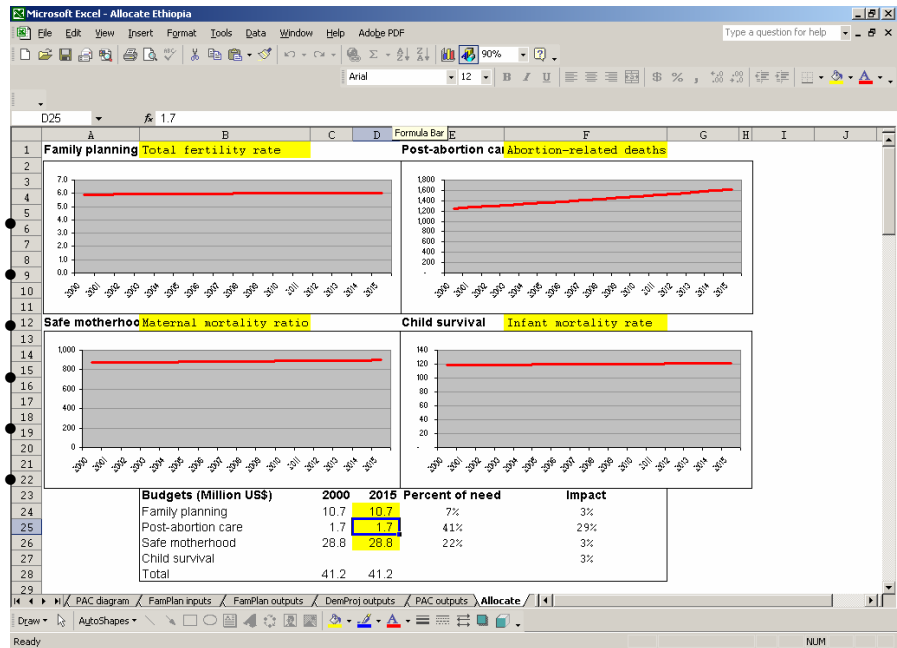
This is the summary screen from the PAC sub-module that must be copied and then pasted into worksheet in the **Allocate** Excel workbook that is labeled, "PAC outputs." In order to complete this process, first click on the "Edit" option from the menu bar, and then move to "Copy all." Without closing the Spectrum program, move to the Excel worksheet tab that is labeled "PAC outputs," which looks like the screen displayed below:

	2000	2001	2002	2003	2004	2005
1 Post-Abortion Care Summary Table						
2	2000	2001	2002	2003	2004	2005
3						
4 Maternal Deaths: Total	0.04	0.04	0.04	0.04	0.04	0.04
5 Maternal Deaths from wanted births	0.02	0.02	0.02	0.02	0.03	0.03
6 Maternal Deaths from unwanted births	0.01	0.01	0.01	0.01	0.01	0.01
7 Maternal Deaths from treated illegal abortions	0	0	0	0	0	0
8 Maternal Deaths from untreated illegal abortions	0	0	0	0	0	0
9 Abortions	1.44	1.44	1.44	1.44	1.44	1.43
10 Illegal abortions	1.44	1.44	1.44	1.44	1.44	1.43
11 Illegal abortions not needing treatment	1.01	1.01	1.01	1.01	1	1
12 Illegal abortions needing treatment	0.43	0.43	0.43	0.43	0.43	0.43
13 Treated illegal abortions	0	0	0	0	0	0
14 Untreated illegal abortions	0.43	0.43	0.43	0.43	0.43	0.43
15 MMR	0	0	0	0	0	0
16 Maternal deaths per 100,000 abortions	0	0	0	0	0	0
17 Lives saved	0	0	0	0	0	0
18						
19						
20						
21						
22						
23						
24						
25						
26						

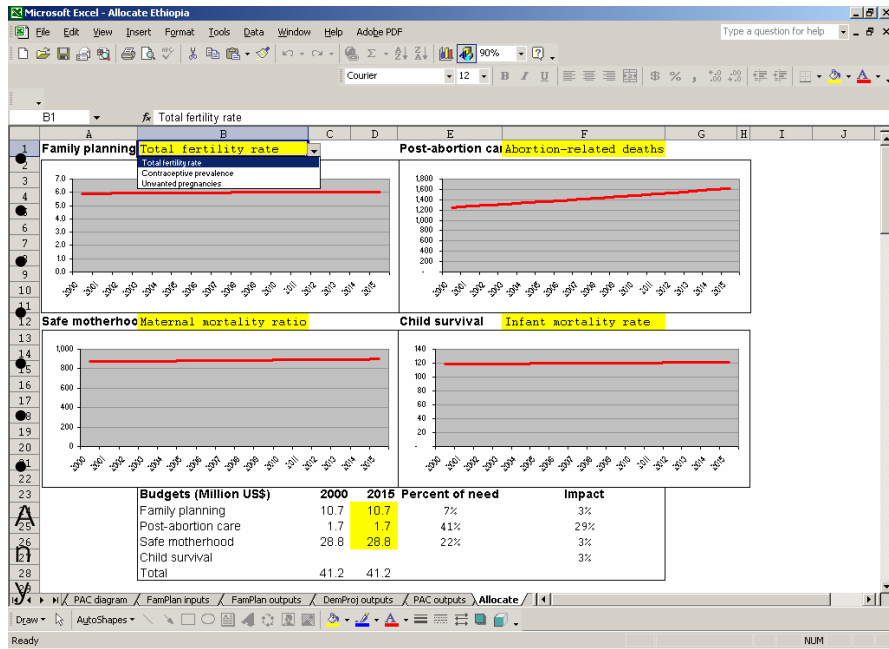
While in Excel, point the cursor to the upper left-hand cell of the worksheet, cell A1, that reads "Post-abortion Care Summary Table." Then select the Paste command that is on the menu bar above, and the copying will be executed.

D. Using the *Allocate* Model

Assuming that the transfer of the output from the Spectrum modules and the SMM have all been completed, move to the worksheet in the *Allocate* workbook titled, "Allocate." The worksheet screen looks like the one below:



There are four graphs on this screen, each of which displays the output for four different areas of analysis: family planning, post-abortion care, safe motherhood, and child survival. Different variables representing outcomes for the different analysis areas can be viewed by clicking on the cells highlighted in yellow. As an example, the screen displays the various choices for family planning that can be selected by first clicking on the cell with the label, "Total fertility rate," and then clicking on the downward arrow, which results in the following screen:



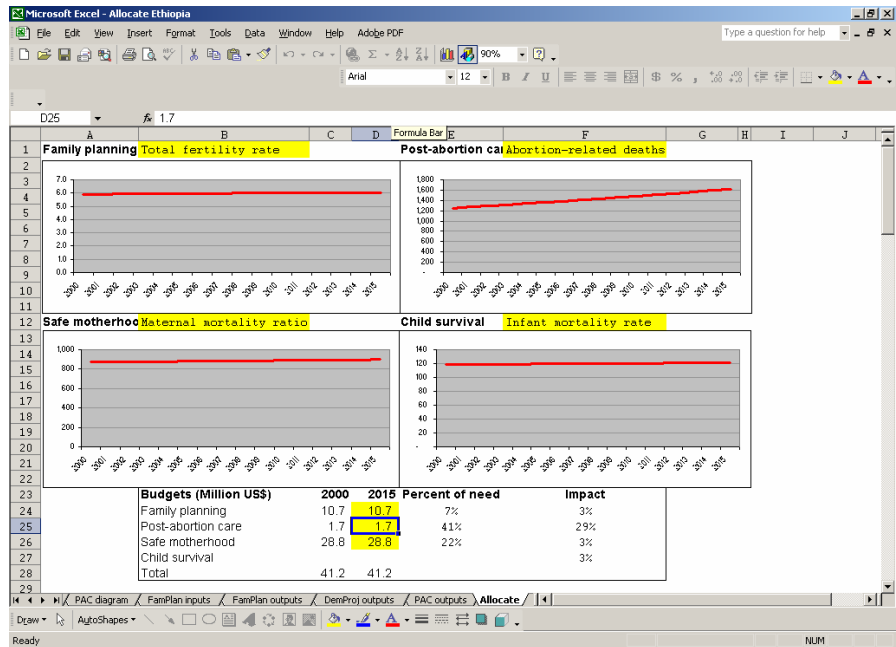
O
f

Any of the three choices for family planning outcomes – total fertility rate, contraceptive prevalence rate, or unintended pregnancies – can be displayed by clicking on the desired series as shown in the pull-down menu. The same process can be followed to display alternative outcomes for the other analysis areas.

The list of possible outcomes for each area appears here. Note that each outcome is described fully in the Outputs chapter above:

- Family planning: total fertility rate, contraceptive prevalence rate, unintended pregnancies
- Post-abortion care: abortion-related deaths, number of abortions
- Safe motherhood: maternal mortality ratio, number of maternal deaths
- Child survival: infant mortality rate, under-five mortality rate, number of child deaths

The contents of the box on the lower third of the worksheet are the items to be manipulated in order to perform the analysis of the *Allocate* model. The initial screen is repeated here for easier reference:



The contents of the box on the lower third of the worksheet will be manipulated in order to perform analyses using the *Allocate* model. The initial screen is repeated here for easier reference. The first column in the box shows the four areas of analysis for the model. The second column displays the current expenditures for each analysis area for the base year of the scenario, based on the results of FamPlan (including PAC) and the SMM. Note that total expenditures for CS are not listed, as this is only an outcome variable in the model.

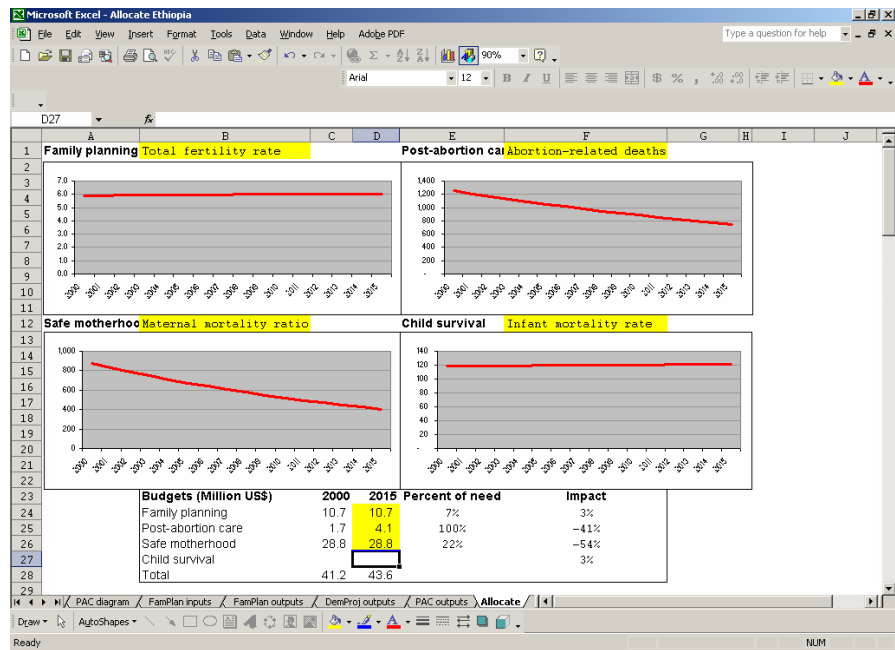
The third column, highlighted in yellow, displays the initial values for the budgets for the final year of the *Allocate* scenario. It is this column that you will change in order to see the results of new resource allocation patterns. The fourth column indicates the percent of need that is met for each of the four analysis areas. "Need" is defined differently for each area:

- Family planning: fulfilling all unmet need for contraceptives
- Post-abortion care: treating all abortions requiring treatment

- Safe motherhood: expenditures determined by the “Ideal” budget as defined by the SMM

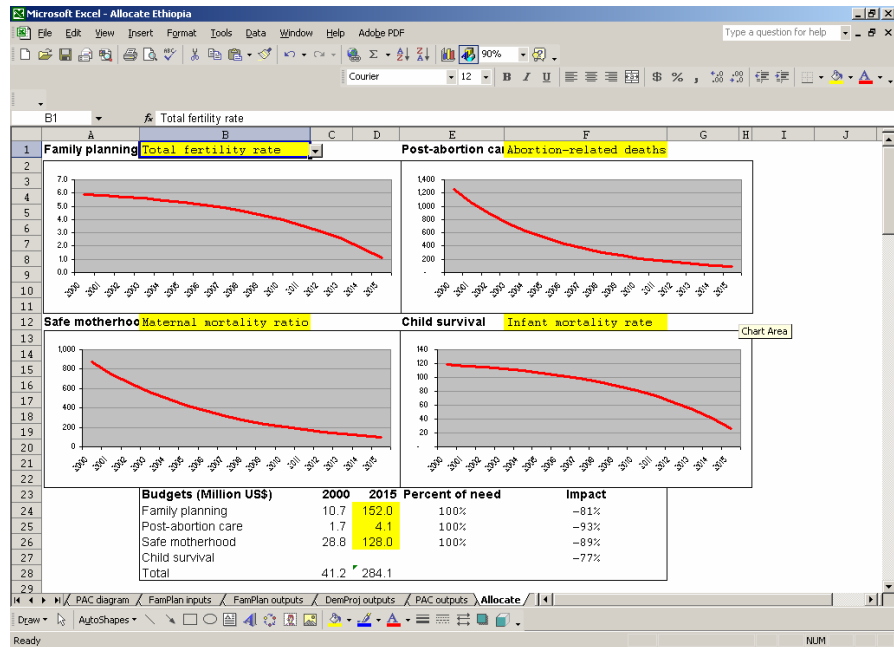
The fifth column displays the impact of the changing budgets on the outcome variables selected. Note that the impact may vary within a particular area of analysis, depending on the outcome variable that is selected. This will be discussed further below, along with examples of some analyses.

One example of analysis would be to fund one intervention fully. For simplicity, the result of fully funding post-abortion care is shown below. The proposed budget for PAC is entered into the middle yellow-highlighted cell. The amount can be adjusted repeatedly until the “percent in need” reaches 100%.



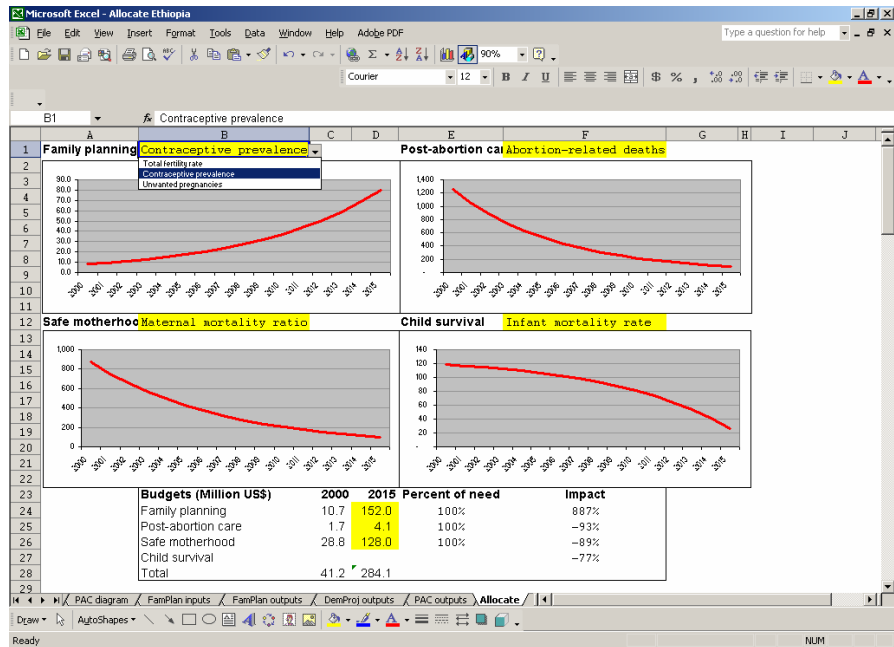
An increase in the amount budgeted to PAC to US\$4.1 million reaches 100% coverage – that is, treats all abortions that need treatment. The result is that abortion-related deaths decrease by 41%, and the MMR decreases by 54%, from 871 to 409. Total expenditures for reproductive health increase from US\$41.2 million to US\$43.6 million.

Another example of analysis would be to fund all of the interventions in all of the areas of analysis completely, as seen below.



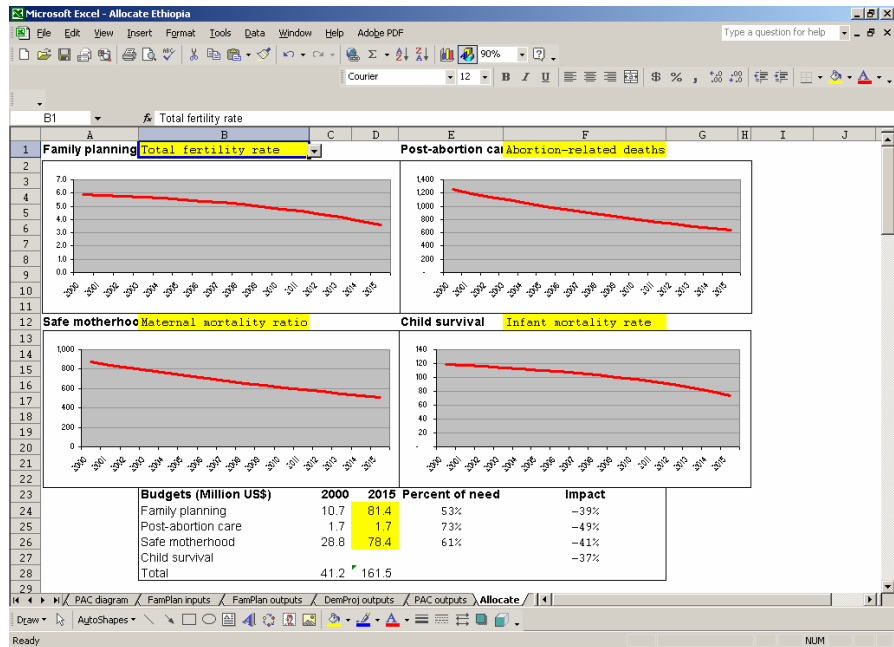
The impact on all of the outcome variables is even greater with this scenario. By 2015, the TFR declines by 81%, the number of abortion-related deaths decreases by 93%, the MMR declines by 89%, and the IMR decreases by 77%. The overall budget, however, increases substantially to a total of US\$284.1 million, or an increase of 590%.

These results can also be examined using different outcome variables. For example, suppose the RHAP targets the CPR in its family planning program, rather than the TFR. Using the same example as above, where all of the areas are fully funded, the outcome variable in family planning can be changed to show the impact of a fully funded program on the CPR:



The impact of fully funding all of these areas is to increase the CPR by 887%. Note that the funding level remains the same – the only difference here is that the outcome variable for family planning has been changed.

Given that increasing expenditures from US\$41 million to US\$284 million is highly unlikely, whatever the country and circumstances, a final scenario might examine the impact of a budget amount that is between these two figures. If the budget for each of the three areas is increased halfway from the current level to the level of 100% coverage, the resulting impacts are:



Note that, when the allocation of the budget changes among each of the three major areas, it only changes at the aggregate level. Overall cost-effectiveness might be increased by going back to the original models and re-allocating at the intervention level, especially for the SMM.

E. Saving the Scenario

It is always a good idea to save the scenario whenever you have made any major changes to assumptions or have finalized a scenario. To save the scenario without changing the name, choose "File" from the menu bar and then "Save" from the pull-down menu in Excel.

To save the scenario with a different name, choose "File" from the menu bar and then select "Save as" from the pull-down menu in Excel. You will then have a chance to specify a new file name for the scenario.

VI.

Methodology

The methodologies used in the family planning, post-abortion care and safe motherhood calculations are described fully in the manuals for those modules. Changes in funding for safe motherhood and post-abortion care are used to re-calculate those models to determine the effects on key indicators. The family planning model (FamPlan) resides in Spectrum not in the *Allocate* Excel spreadsheet. The effects of changes in funding on the family planning indicators are estimated in the *Allocate* model. This chapter describes the methodology used to make those estimates.

A change in the funding level for family planning in the final year (FP\$) results in a change in contraceptive prevalence by increasing or decreasing the number of family planning users that can be supported. Contraceptive prevalence (CPR) is increased or decreased by the ratio of the number of users that can be supported in the final year to the number of users in the final year in the base projection (FPUsers).

$$CPR_{t,new} = CPR_{t,old} * (FP\$_{t,new} / CostPerUser_t) / FPUserSt_{old}$$

Contraceptive prevalence in the intermediate years is interpolated between the first and last years.

The total fertility rate (TFR) is calculated from the new contraceptive prevalence using the equation for the proximate determinants of fertility.

$$TFR = k * Cc$$

Where Cc is the contraceptive index and k is the product of the indices of the other proximate determinants: proportion married (Cm), postpartum insusceptibility (Ci), abortion (Ca) and pathological sterility (Cs).

$$Cc = 1 - 1.08 * CPR$$

$$K = Cm * Ci * Ca * Cs$$

The number of pregnancies in the last year is calculated as the number of pregnancies in the first year, multiplied by the ratio of the number of married women of reproductive age (MWRA) in the last year to the first year and multiplied by the ratio of the difference between contraceptive prevalence and maximum prevalence (set at 80%) in the first year and last year.

$$\text{Pregnancies}_t = \text{Pregnancies}_1 * \text{MWRA}_t / \text{MWRA}_1 * (80 - \text{CPR}_1) / (80 - \text{CPR}_t)$$

The number of unintended pregnancies (UP) is calculated in a similar manner.

To estimate the impact of changes in family planning funding on safe motherhood, the funding is split between birth spacing and birth limiting according to the ratio in the first year.

Changes in funding for safe motherhood and post-abortion care are used directly in those models to calculate the effects on MMR, maternal deaths, the number of abortions and the number of abortion-related deaths.

VII. References

Stover, J. 2005. *DemProj: A Demographic Projection Model for Development Planning*. Glastonbury, CT: Futures Group. Available at <http://www.futuresgroup.com>.

Stover, J., L. Heaton, and J. Ross. 2005. *FamPlan: A Computer Program for Projecting Family Planning Requirements*. Glastonbury, CT: Futures Group. Available at <http://www.futuresgroup.com>.

VIII. Glossary of Terms

Some of the following terms were obtained from the Population Reference Bureau's *Population Handbook* (1989); others were adapted from the International Union for Scientific Study of Population's (IUSSP's) *Multilingual Demographic Dictionary* (Van de Walle and Henry, 1982); while still others are definitions employed by the Demographic and Health Surveys program executed by ORC Macro. These terms are defined in the context of their use within Spectrum.

Abortions. The number of induced abortions occurring during the year.

Acceptors. The number of new users of a particular method in a particular year. A woman is classified as an acceptor if she starts using a method during the year and was not using that method at the start of the year. Previously she may have been using nothing or she may have been using a different method.

Age-specific fertility rate (ASFR). The number of births in a year for a population of a given age and sex to the mid-year population of that same sex and age group.

Aggregation. A group of elements to be considered as a whole, such as women of reproductive age.

Annual growth rate (GR). The rate at which the population is increasing or decreasing in a given year due to natural increase and net migration, expressed as a percentage of the base population.

Appropriate method mix. The distribution of contraceptive methods that correspond to the individual fertility intentions and personal characteristics of a population of women.

Births. The number of live births occurring during a year.

Cohort. A group of persons who experience certain events within a specified period of time, such as those who are born or who are married in the same year.

Commodities. The amount of supplies required for different methods to provide a specified level of family planning services. Commodities are expressed in terms of numbers of condoms, sterilization kits, injectable vials, IUDs, Norplant implants, pill cycles and vaginal tablets.

Contraceptive prevalence rate (CPR). The percentage of women⁴ of reproductive age using some form of contraception. Most commonly, prevalence is given for women in unions.

Cost per user. The public sector cost of providing family planning, per family planning user.

Couple-year of protection. The number of units of a contraceptive needed to provide protection from pregnancy for one couple for an entire year. For example, 13 units of oral contraceptives are needed to provide one couple with a full year of protection.

Desired fertility rate.⁵ The desired fertility rate is an indicator similar to the total fertility rate. It indicates the average number of children that a woman would have *if her expressed fertility desires were achieved*.

Dialogue box. A box (shown on the computer screen) permitting users to choose among a limited number of options. The box is accompanied by text elaborating on those options.

Disaggregation. A group of elements broken down into subsets, such as a population broken down into single-age categories (ages 1, 2, 3, etc.).

Effectiveness. Effectiveness is the extent by which a contraceptive method lowers the chances to become pregnant in a given month. This measure depends both on the ability of women to conceive and on the method's failure rate.

Fecundity. The calculated total fecundity rate. Total fecundity is the average number of children that would be born to women if none of the proximate determinants was acting to reduce fertility from its biological maximum. In the model, fecundity is calculated for the base year only. It remains constant in all other years.

⁴ Although some methods are male-specific (i.e., condoms and vasectomy), it is conventional to refer to contraceptive users as women or couples because fertility is generally female-specific rather than male-specific.

⁵ The terms "wanted fertility" and "desired fertility" are used interchangeably in this manual. The model uses the term "desired fertility," but users may be more familiar with the "wanted" terminology.

Gross cost. The total public sector cost of providing family planning services.

Growth rates. The increment in total number of contraceptive users from year to year. These are net figures, consisting of new users and the continuing users who remain after previous users either have discontinued or have “aged out.”

Infant mortality rate (IMR). The number of deaths to infants under one year of age per 1,000 live births.

Interpolation. Given two numbers that serve as boundary points, the estimation of values that lie at intervals between the two points. For example, if the total fertility rate for a country or region was actually measured only in 1980 and in 1995, by assigning a relationship between the values from year to year, it is possible to estimate a TFR for each intervening year. (Spectrum uses a linear form of interpolation so that the difference between each annual value is the same. Other nonlinear forms of interpolation also are possible, but are not used in Spectrum.)

Life expectancy (e(0)). The average number of years a newborn can expect to live based on the mortality conditions at the time.

Maternal deaths. The number of women who die from any cause related to or aggravated by pregnancy or its management during pregnancy and childbirth, or who die within 42 days of termination of pregnancy.

Maternal Mortality Rate (MMR). The number of maternal deaths per 100,000 live births.

MWRA. The number of women of reproductive age who are married or in union.

Method mix. The distribution of contraceptive users by contraceptive method.

Mistimed pregnancy. Pregnancies that were wanted to occur, but at a time other than the time of their conception.

Model. Computer system designed to demonstrate the probable effect of two or more variables that might be brought to bear on an outcome. Such models can reduce the effort required to manipulate these factors and present the results in an accessible format.

Module. Synonym for “model.”

Net cost. The net public sector cost of family planning services. This figure is equal to gross cost minus revenue collected.

Normalization. The transformation of a series of data points into a percent distribution summing to 100 percent.

Pop-up menu. A menu (shown on the computer screen) from which users can select items or actions. Pop-up menus can appear anywhere on the screen.

Post-abortion Care (PAC). Strengthening the capacity of health institutions to offer emergency treatment services for complications of spontaneous or unsafely induced abortions; post-abortion family planning and birth spacing counseling and services; and links between emergency post-abortion treatment services and reproductive health care.

Postpartum insusceptibility. The period after a birth during which a woman is not exposed to the risk of pregnancy either because of postpartum amenorrhea or because of postpartum abstinence.

Pregnancies. The number of pregnancies occurring during a year. Pregnancies can be wanted, wanted later, or not wanted.

Proximate determinants. Variables that directly impinge on fertility outcomes; these variables include the proportion of women in sexual union, the duration of the period of inability to conceive following a birth, the level and quality of contraceptive practice and, to a lesser degree, the underlying capability to conceive, the level of induced abortion, and the prevalence of pathological sterility.

Pull-down menu. A menu (shown on the computer screen) opened by clicking on key words at the top edge of the screen. Pull-down menus allow users to select operations.

Radio button. These buttons (shown on the computer screen) emulate raised buttons on early radios, which were punched to select radio stations. The graphically portrayed raised “radio buttons” on interfaces permit users to select among at least three alternatives.

Revenue. The total amount of revenue collected from fees for family planning services.

Total abortion rate. The average number of induced abortions a woman would have if she survived to age 49 and had abortions at the prevailing age-specific rates. Thus, in concept, it is similar to the total fertility rate.

Total fertility rate. The average number of children that would be born alive to a woman (or a group of women) during her lifetime if she were to pass through all her childbearing years conforming to the age-specific fertility rates of a given year.

Under five mortality rate (U5MR). The number of deaths to children under the age of five per 1,000 live births.

Unmet need. Refers to couples who presumably should be using contraception based on their fertility desires and susceptibility to a pregnancy, but are not using contraception.

Unwanted pregnancy. Either a pregnancy that occurs due to method failure, or simply one that occurs to a woman who did not want to become pregnant at the time she conceived.

Users. The number of women who are using some form of contraception.

Wanted pregnancies. Calculated as the total pregnancies that were wanted at the time of conception or were wanted to occur at a later time.

Wanted total fertility rate. An indicator similar to the total fertility rate. The wanted total fertility rate is calculated as the level of fertility that would have prevailed during the past few years if all unwanted births had been prevented. (See also desired fertility rate.)

WRA. The number of women of reproductive age, 15-49.

IX.

Abbreviations

AIM	AIDS Impact Model
ASFR	age-specific fertility rate
CPR	contraceptive prevalence rate
CR	condom requirements
CS	child survival
CYP	couple-year of protection
DHS	Demographic and Health Survey
ESOG	Ethiopian Society of Obstetricians and Gynecologists
FP	family planning
GR	annual growth rate
IMR	infant mortality rate
MBP	mother-baby costing package
M&E	monitoring and evaluation
MMR	maternal mortality ratio
MNPI	Maternal and Neonatal Program Effort Index
MWRA	married women of reproductive age
MOH	Ministry of Health
PAC	post-abortion care
PMTCT	prevention of mother-to-child transmission
RHAP	reproductive health action plans
SMM	Safe Motherhood Model
TFR	total fertility rate

U5MR	under five mortality rate
USAID	United States Agency for International Development
WHO	World Health Organization
WRA	women of reproductive age



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