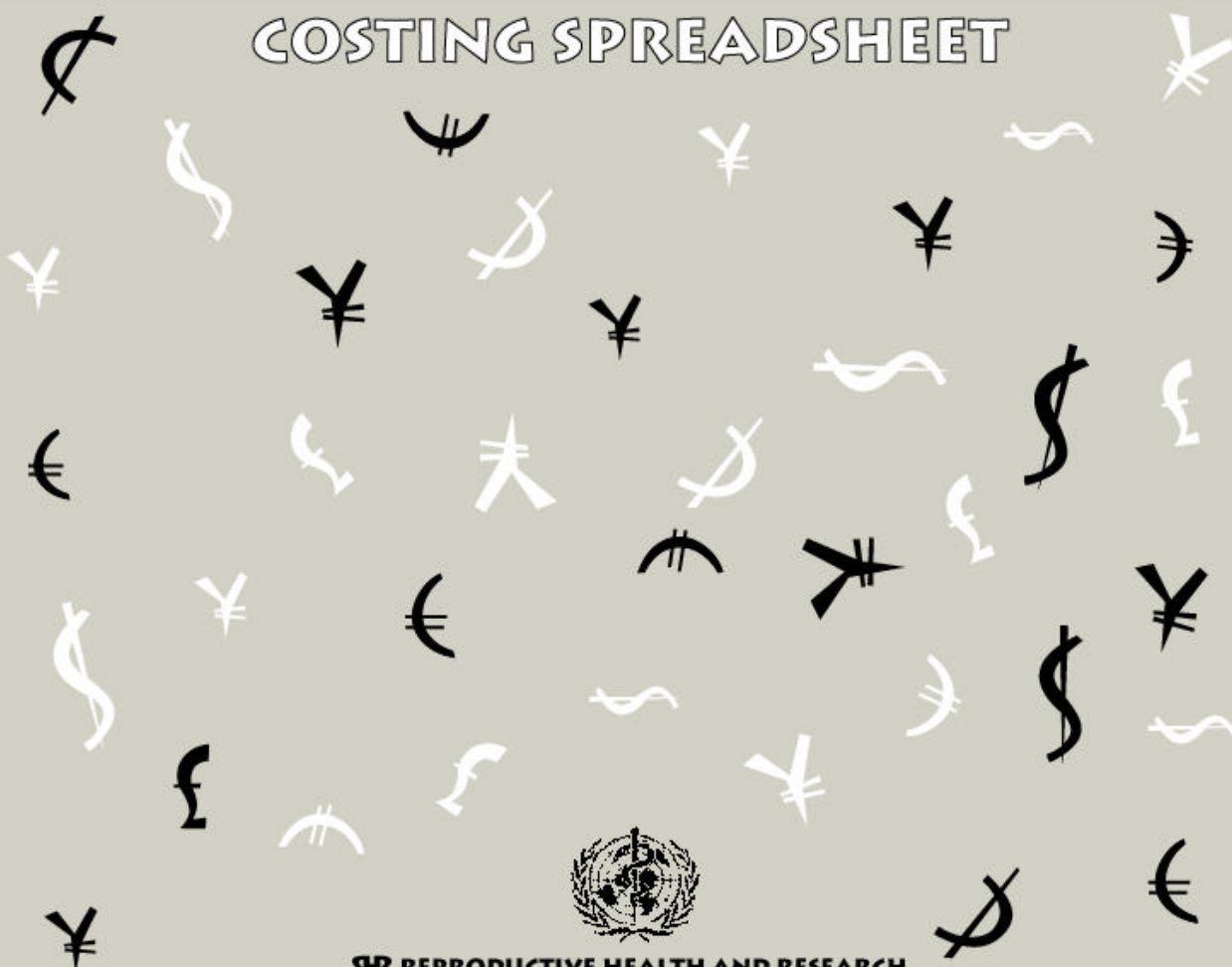


MOTHER-BABY PACKAGE

COSTING SPREADSHEET



RH REPRODUCTIVE HEALTH AND RESEARCH
WORLD HEALTH ORGANIZATION

Mother-Baby Package Costing Spreadsheet

Version 1.01, December 1999

Copyright © 1999 World Health Organization

This document is not a formal publication of the World Health Organization (WHO), and all rights are reserved by the Organization. The document may, however, be freely reviewed, abstracted, reproduced or translated, in part or in whole, but not for sale or for use in conjunction with commercial purposes. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

Table of Contents

Introduction.....	1
Part I. Overview of the spreadsheet model	3
General description	3
Cost estimates generated.....	3
Direct, overhead and capital cost.....	4
Health post, health centre, hospital.....	5
Standard or “ideal” practice versus current practice	6
Adaptation and local data requirements	7
A sample timetable for a district-specific study.....	8
Part II. The worksheets.....	9
Demography worksheet	10
Referral worksheet.....	22
Capital cost worksheet	25
Overhead cost worksheet.....	26
Direct cost worksheet.....	29
Drug list worksheet.....	35
Salary worksheet	37
Health post, health centre and hospital worksheets	41
Summary worksheet	45
Cost per life saved worksheet.....	49
Foreign exchange worksheet.....	49
Part III. Calculating incremental costs and charting results.....	51
Checking and calibrating the model.....	51
Part IV. The <i>Mother-Baby Package</i> interventions.....	54
Appendix A: Assumptions	99
Appendix B: Formulae used in the model	101
Appendix C: National estimates of coverage of maternity care.....	106
Appendix D: Contraceptive prevalence data, 1994.....	109
Appendix E: Equipment list for <i>Mother-Baby Package</i>	112
Bibliography.....	115

List of Figures

Figure 1 Direct and recurrent cost categories	5
Figure 2 “Standard practice” versus “current practice” models.....	6
Figure 3 Diagram of worksheets in the Mother-Baby Package Costing Spreadsheet.....	9
Figure 4 Demography worksheet: user inputs and calculations	10
Figure 5 Referral worksheet: user inputs and calculations	22
Figure 6 Schematic diagram of referral patterns.....	24
Figure 7 Capital cost worksheet: user inputs and calculations	25
Figure 8 Overhead cost worksheet: user inputs and calculations.....	27
Figure 9 Direct cost worksheet: user inputs and calculations.....	30
Figure 10 Data consolidation form for antenatal care.....	33
Figure 11 Drug list worksheet: user inputs and calculations	36
Figure 12 Salary worksheet: user inputs and calculations	37
Figure 13 Health post, health centre, hospital worksheets: inputs and calculations	43
Figure 14 Summary worksheet: user inputs and calculations.....	46
Figure 15 Foreign exchange worksheet: user inputs and calculations	49

List of Tables

Table 1 Interventions included in the Mother-Baby Package Costing Spreadsheet.....	3
Table 2 Cost categories: direct, overhead and capital cost	4
Table 3 Staffing, infrastructure, and services provided, by service level.....	6
Table 4 Changing data cells in the worksheets to reflect local conditions.....	7
Table 5 Sample three-month timetable for a district-specific study	8
Table 6 Antenatal and delivery care coverage rates in selected regions.....	13
Table 7 Contraceptive prevalence rates in selected regions	13
Table 8 Demand for family planning among married women, selected countries, 1990-1994.....	14
Table 9 Estimated prevalence of severe anaemia* in pregnant women in selected regions.....	16
Table 10 Prevalence of syphilis among pregnant women.....	16
Table 11 Prevalence of gonorrhoea and chlamydia among pregnant women.....	17
Table 12 Unsafe abortion in selected regions	17
Table 13 Estimated incidence of eclampsia in pregnant women in selected regions.....	18
Table 14 Contraceptive method mix in selected regions	20
Table 15 Sources of data on capital cost.....	26
Table 16 Maintenance and utility costs.....	28
Table 17 Cost input categories.....	30

List of Screen Printouts

Screen printout 1 Demography worksheet	11
Screen printout 2 Population (demography worksheet)	12
Screen printout 3 Coverage rates (demography worksheet).....	12
Screen printout 4 Incidence and prevalence of complications (demography worksheet)	15
Screen printout 5 Infrastructure, facility utilization, care-seeking behaviour (demography worksheet)	20
Screen printout 6 Referral worksheet	23
Screen printout 7 Annual capital cost (capital cost worksheet)	25
Screen printout 8 Maintenance and utility costs (overhead cost worksheet)	27
Screen printout 9 Support staff cost (salary worksheet)	28
Screen printout 10 Management and supervision cost (overhead cost worksheet)	28
Screen printout 11 Information, health education and communication cost (overhead cost worksheet)	29
Screen printout 12 Direct cost worksheet (selected rows only)	29
Screen printout 13 Adding a drug or supply to the treatment table (direct cost worksheet)	32
Screen printout 14 Button to update summary tables (direct cost worksheet)	35
Screen printout 15 Drug list worksheet, including drugs, consumable supplies, small equipment ..	36
Screen printout 16 Button to sort drug list (drug list worksheet)	36
Screen printout 17 Clinical salaries (salary worksheet)	38
Screen printout 18 Staff time requirement input matrix (salary worksheet)	40
Screen printout 19 Staff requirements, by facility type	41
Screen printout 20 Health post worksheet	42
Screen printout 21 Direct cost summary per client (health post worksheet).....	43
Screen printout 22 Direct cost summary totals (health post worksheet).....	44
Screen printout 23 Overhead cost totals (health post worksheet).....	44
Screen printout 24 Capital cost totals (health post worksheet)	44
Screen printout 25 Total cost estimates (health post worksheet)	45
Screen printout 26 Button to update summary tables	45
Screen printout 27 Summary worksheet	46
Screen printout 28 Total cost by intervention (summary worksheet).....	47
Screen printout 29 Total cost by input (summary worksheet).....	47
Screen printout 30 Grand total, per capita, per client costs (summary worksheet).....	48
Screen printout 31 Cost per life saved worksheet.....	48
Screen printout 32 Drug list worksheet (selected rows)	50
Screen printout 33 Capital cost worksheet	50
Screen printout 34 Grand totals by foreign currency requirement (summary worksheet)	50
Screen printout 35 Editing file linkages among current, standard and graphing workbooks.....	51
Screen printout 36 Sample chart of incremental cost from “graph” file	52
Screen printout 37 Sample chart of average treatment cost at hospitals from “graph” file.....	53

Acknowledgements

The World Health Organization is grateful for the financial and technical support provided by The World Bank and the United States Agency for International Development for the development and field-testing of the *Mother-Baby Package Costing Spreadsheet*.

The *Mother-Baby Package Costing Spreadsheet* has been prepared by a team led by Craig Lissner of the WHO Department of Reproductive Health and Research. The first draft of the model was developed by Peter Cowley of USAID and Jose Luis Bobadilla of the World Bank; major revisions were subsequently carried out by Eva Weissman, who also prepared this manual. Important refinements to the clinical and epidemiological aspects of the model were made by Jelka Zupan, Elisabeth Åhman, Anne Thompson, Richard Guidotti and Monir Islam of WHO and Matthews Mattai of the Christian Medical College in Vellore, India. WHO is indebted to Katherine Capra, Willy Seoane and Colleen Conroy of the USAID MotherCare project for their work in field-testing of the model in Bolivia. WHO is grateful to Katherine Krasovec of Abt Associates, John Fiedler of Social Sectors Development Strategies, and the USAID Partnerships for Health Reform Project for valuable contributions to the design of the spreadsheet model and the planning phase of the Bolivian field test. For their work in the application in Uganda, WHO would like to thank Olive Sentumbwe-Mugisa, the Uganda National Safe Motherhood Programme Coordinator, and A.K. Mbonye of the Reproductive Health Division of the Uganda Ministry of Health. Finally, prior to publication, Stefano Bertozzi of the Mexico Instituto Nacional de Salud Publica made insightful inputs to the final revision of the model.

Cover design: Máire Ní Mhearáin

Introduction

The World Health Organization Safe Motherhood programme developed the *Mother-Baby Package*¹ in 1994 to help countries to identify nationally appropriate packages of essential interventions to reduce maternal and newborn mortality and morbidity.

Information on the programme cost at the national or district level is critical to the success of any safe motherhood programme. This information can be used:

- to assist in the definition of essential packages or clusters of interventions, based on the *Mother-Baby Package*, that are appropriate to the local setting and respond to local needs;
- to support the development of operationally feasible and sustainable plans for implementing the local packages of interventions;
- to compare the cost of the *Mother-Baby Package* interventions with other locally-defined clusters of interventions;
- to assist in the development of plans for financing the *Mother-Baby Package* interventions; and
- to help in determining a rational scheme of deploying personnel, equipment and other inputs required to implement the package.

The *Mother-Baby Package Costing Spreadsheet* is used to estimate the cost of implementing a set of maternal and newborn health interventions at the district level. The default settings of the model represent a hypothetical rural, low-income district population. For a very rough estimation of total cost, based on “standard” treatment, the default settings can be used with minimal modification. For a more rigorous analysis that better reflects the local situation, the inputs should be more critically examined and modified. Specifically, using locally collected data, the model can be used first to estimate the actual cost of current services, and second to estimate cost of upgrading the district health system to meet the standards in the *Mother-Baby Package*. The difference between the “current” and the “standard” cost estimates represents the incremental cost of strengthening the health system in the district under study. Included are estimates of total, average per capita and per-birth cost for the district. The estimates are further broken down by input (such as drugs, vaccines, salaries and infrastructure), by intervention (such as management of normal birth, haemorrhage, eclampsia and sepsis), and by service location or level (hospital, health centre and health post).

In summary, good estimates of the cost are critical to any effort to address maternal and newborn mortality and morbidity. This manual, and the accompanying spreadsheet, has been designed to assist local programme managers in quickly making such cost estimates.

Assumptions. The *Mother-Baby Package Costing Spreadsheet* is a projection model, based on a series of assumptions. These assumptions are detailed in Appendix A. Before applying the spreadsheet, it is critical to assess the validity of these assumptions in the proposed application.

Target audience. An analysis carried out using the spreadsheet could be targeted at maternal and newborn health and safe motherhood planners, managers and policy makers at the national and district levels. The results of the analysis might also be of interest to potential programme donors, multilateral and bilateral donor agencies, NGOs and other interested parties.

Resources required to carry out a district-level study. The resources required to carry out an analysis based on the *Mother-Baby Package Costing Spreadsheet* will vary depending on the setting in which it is applied, the number of districts studied, and other local factors. These materials have been

¹ WHO. *Mother-Baby Package: Implementing safe motherhood in countries*. Geneva, World Health Organization, 1994 (WHO/FHE/MSM/94.11).

developed in such a way that a local health economist with experience using spreadsheet software should be able to perform the analysis with minimal support, apart from assistance in data collection and analysis. Experience has shown that applying the spreadsheet in one district requires approximately one to two months for planning, preparation and adaptation, followed by a week for data collection, and then one to two months for analyzing and writing up the results (see sample timetable on page 8). As additional districts are added, the resources required will increase correspondingly.

Hardware and software needs. The *Mother-Baby Package Costing Spreadsheet* has been developed using Microsoft Excel spreadsheet software, version 5.0,² running on the Windows 3.1 operating systems. The spreadsheet has been tested and also works properly using more recent versions of this software.³ The enclosed diskette contains the spreadsheet files in Excel format, but does not include the required Excel software, which is available from many commercial software vendors.

User guide. Part I of this manual provides a general overview of the spreadsheet model, the type of data that will be required, the types of cost estimates the model will generate and information on how to use the spreadsheet. Part II follows with a more detailed description. Here the user will find more in-depth information on each worksheet, what kind of information it requires and processes and how it interrelates with the other worksheets. It describes where to collect the data or, if the data collection proves difficult, how to arrive at reasonable proxy estimates. Part III describes how to calculate the incremental cost and chart the results. Part IV of the manual provides a closer look at the clinical aspects of the interventions of the *Mother-Baby Package* and how they are implemented in the model. It explains the scope of each intervention and the treatment protocols proposed at the different levels of the health system. It lists all the drugs and medical supplies needed and provides estimates of the clinical staff time required for the individual interventions. For users who are interested in an even deeper insight into the workings of the model Appendix B provides detail about the formulae and technical features used in the model.

This manual is not intended to serve as a clinical guideline. The clinical management algorithms included in the spreadsheet are to be used for indicative cost estimation purposes only. To help guide clinical practice, WHO is developing chart booklets and other materials that describe the minimum, essential care for pregnancy and childbirth.⁴ Contact us at the address below for more information.

Mother-Baby Package Costing Spreadsheet is available on the Web! The latest version of the *Mother-Baby Package Costing Spreadsheet* is always available for download free of charge from the WHO site on the World Wide Web. On this site you will also find answers to "frequently asked questions" and other information about the model. Please visit our web site at:

<http://www.who.int/reproductive-health/economics/>

Version One. While the spreadsheet and manual have been developed and have evolved over the course of several years, this is the first published version. If you use the spreadsheet, we should be delighted to receive a copy of your report or of any articles that are based on the spreadsheet. We also welcome feedback that would enable us to improve future versions. Please do not hesitate to contact us at the address below:

Department of Reproductive Health and Research
World Health Organization
CH-1211 Geneva 27 Switzerland
E-Mail: LissnerC@who.int

² Microsoft Corporation. *Microsoft Excel, version 5.0*. Redmond, WA, USA, Microsoft Corporation, 1993.

³ The spreadsheet also functions properly in Microsoft Excel 97, under both Windows NT and Windows 95 operating systems.

⁴ *Integrated management of pregnancy and childbirth: Essential care practice guidelines*. Geneva, World Health Organization, Department of Reproductive Health and Research, October 1999.

Part I. Overview of the spreadsheet model

General description

The *Mother-Baby Package Costing Spreadsheet* estimates the cost of providing to a target population the maternal and newborn interventions shown in Table 1.

Table 1 Interventions included in the Mother-Baby Package Costing Spreadsheet

	<i>Terminology used in the model</i>
Care during pregnancy	
Antenatal care.....	<i>Antenatal Care</i>
Treatment of severe anaemia	<i>Anaemia, severe</i>
Treatment of syphilis.....	<i>STD—Syphilis</i>
Treatment of other STDs such as gonorrhoea and chlamydia	<i>STD—Other</i>
Care during and after delivery	
Delivery by a skilled birth attendant, including clean and safe delivery and routine newborn care	<i>Normal Delivery</i>
Management of eclampsia	<i>Eclampsia</i>
Management of postpartum haemorrhage	<i>Haemorrhage</i>
Management of obstructed labour/caesarean delivery	<i>Obstructed Labour</i>
Management of sepsis	<i>Sepsis</i>
Management of basic newborn complications.....	<i>Neonatal Complications</i>
Postpartum care.....	<i>Postpartum Care</i>
Management of abortion complications	<i>Abortion Complications</i>
Postpartum family planning	
Condom.....	<i>FP—Condom</i>
Depo-Provera	<i>FP—Depo-Provera</i>
IUD.....	<i>FP—IUD</i>
Norplant.....	<i>FP—Norplant</i>
Oral contraceptives.....	<i>FP—Pill</i>
Sterilization.....	<i>FP—Sterilization</i>

All of these interventions are included in the *Mother-Baby Package*. A more thorough discussion of the interventions contained in the package can be found in Part IV of this manual.

Like the *Mother-Baby Package*, the costing model can and should be adapted to fit the local needs. While the model reflects the requirements of the *Mother-Baby Package*, it is by no means binding. A country may well have its own set of maternal and newborn interventions or it might want to expand or reduce the scope of an intervention contained in the *Mother-Baby Package*. The user can easily change the data in the model to reflect the requirements of a nationally developed safe motherhood programme.

Cost estimates generated

The model will not only provide the user with a cost estimate for the implementation of the whole *Mother-Baby Package*, but will also break down the total cost in a variety of ways. The user will be able to obtain cost estimates:

- for the individual interventions,
- for the different types of input (drugs, salaries, etc.),
- for the different types of costs (recurrent and capital costs),
- per facility, per capita, and per birth,
- local cost/imported cost (foreign exchange requirements),
- and more.

Direct, overhead and capital cost

The model distinguishes between two major cost categories: one-time, non-recurrent, capital expenditures (such as for the construction of facilities or the purchase of large equipment) and recurrent costs, which are also often called operating costs.⁵ Recurrent costs include, for instance, drugs and salaries of clinical staff, which are incurred on a regular basis.

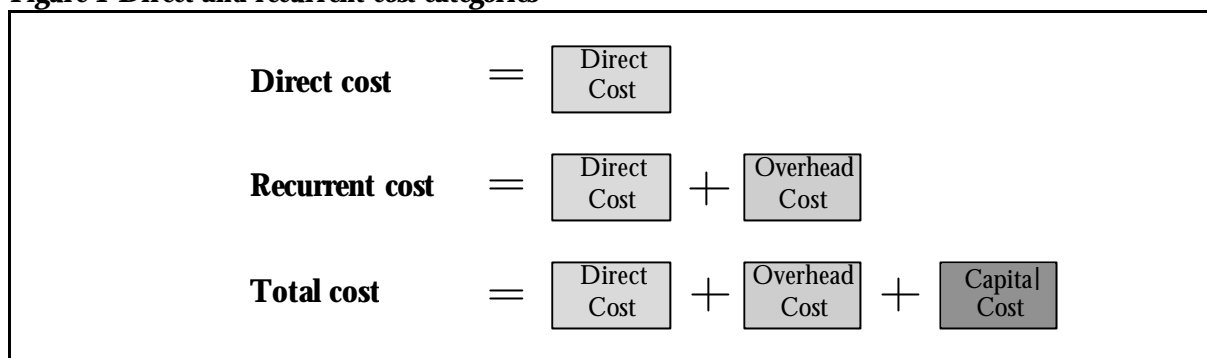
Recurrent costs can be subdivided again into direct costs and indirect costs. Direct costs are costs that are directly attributable to an individual intervention; the cost of the iron tablets for the treatment of severe anaemia would be an example. There are also recurrent costs that cannot be attributed directly to a certain intervention. These are, for instance, the costs of electricity for the building or the salary of the person who cleans the facility. These cost are called indirect, or overhead costs. The relationship among these cost categories is explained in Table 2 and Figure 1.

Table 2 Cost categories: direct, overhead and capital cost

	Direct cost	Overhead cost	Capital cost
Definition	All recurrent costs that can be directly attributed to one intervention	All recurrent costs that are not directly attributable to one intervention	One-time, non-recurrent, capital expenditures
Examples	Drugs, medical supplies, time clinical staff spends with the client	Maintenance and utility costs for the facility, salaries of support personnel, IEC and social marketing programme cost, supervision and management	Construction cost for a medical facility, purchase of large equipment, emergency transportation vehicles

The model allows the user to choose how comprehensive the cost estimate should be. The following figure shows the type of estimates that the model generates.

⁵ For a comprehensive discussion of costing, see Creese A, Parker D, eds. *Cost analysis in primary health care*. Geneva, World Health Organization, 1994.

Figure 1 Direct and recurrent cost categories

If one is only interested in the costs that are directly associated with providing the individual interventions, one might want to look at the **direct cost** estimates. This will be particularly useful when comparing the individual interventions. Some of the most effective interventions in the *Mother-Baby Package*, such as, for instance, STD treatment, can prove quite inexpensive. If a country or district is not able to implement all the interventions of the *Mother-Baby Package* at once due to limited resources, the direct cost estimates can help inform priority setting on which interventions to introduce first. The necessary data are largely collected through facility surveys. The data collection will take about one week per district.

The second cost estimate provided is **recurrent or operating costs**. Often, a donor or the national government has already provided the start-up or capital costs for a safe motherhood programme. The district might be responsible for all costs associated with the daily operations. The recurrent cost gives an estimate of the annual financial burden a district will face. Recurrent costs are also important for considering financing schemes such as insurance programmes or cost recovery schemes. The data collection necessary to obtain this cost estimate will be more time-consuming than for the direct cost estimate. Besides gathering the treatment information, the user will have to collect data on maintenance and utility costs, the number and compensation of support staff as well as information on existing and planned IEC programmes and supervision.

The most comprehensive estimate is the **total cost**, which includes capital costs. In addition to the information required for the recurrent cost option, the user has to collect information regarding the cost of construction or renovation of health facilities, the cost of equipment and other capital items. In principle, capital costs can be annualized and attributed directly to interventions. However, in the model, capital costs are not attributed to specific interventions in order to simplify the approach.

Health post, health centre, hospital

The model also estimates these costs for each of the three levels of the typical district health system: health posts, health centres, and hospitals.

While the health systems of many countries are organized under such a three-tiered system (not including referral hospitals, which are often considered the fourth tier), the names used for the different levels might not match the ones used in the model. What the model calls a health post might in some countries be called an aid post or a sub-dispensary. Health centres might be known as dispensaries or maternity units. Some units might be called health centres but actually only provide care equivalent to that of a typical health post. What is important is not what the facility is called, but the type of care that is provided at the facility. Table 3 provides a rough overview of how the different levels are defined in the model.

Table 3 Staffing, infrastructure, and services provided, by service level

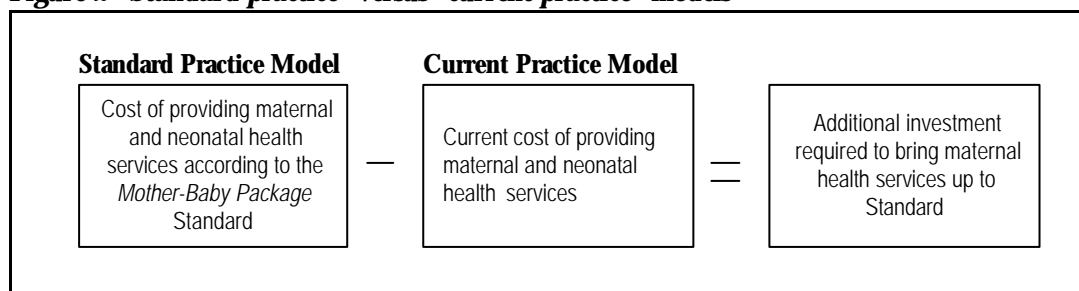
<p>Health post</p> <ul style="list-style-type: none"> • Staffed by 1 or 2 auxiliary workers • Mainly provision of antenatal care and family planning services • No beds • No laboratory facilities
<p>Health centre</p> <ul style="list-style-type: none"> • At least 1 doctor, professional nurse or midwife and some auxiliaries responsible for maternal and child health • May have a few beds for short stay patients and for maternity care • Surgical facilities are generally only sufficient for minor outpatient procedures (such as IUD insertion or minor suturing) • Small basic laboratory
<p>Hospital</p> <ul style="list-style-type: none"> • Unspecialized district hospital capable of performing surgery such as caesarean delivery and other obstetric emergency procedures • Equipped with anaesthesia equipment and a laboratory • Able to provide blood transfusions • Able to take care of sick newborns/low birth weight/pre-term newborns

Standard or “ideal ” practice versus current practice

The district health system will probably already be providing certain maternal and newborn services to a certain share of the population. The cost of implementing the *Mother-Baby Package* will therefore constitute an improvement of quality of care, coupled with an expansion of existing services. While it is interesting to know the total cost of an “ideal” package of interventions based on the *Mother-Baby Package*, health planners will probably be more interested in how much of an additional investment will be necessary to bring quality and coverage of existing maternal and newborn health services up to the standard of the *Mother-Baby Package*.

The model takes this into account. It consists of two very similar models: the “current practice” model, which calculates the amount currently being spent on the provision of maternal and newborn services; and the “standard practice” model which calculates the cost of providing a *Mother-Baby Package* according to national or WHO guidelines and standards. As seen in Figure 2, the difference between the “current” and the “standard” practice models represents an estimate of the additional investment and expenditure required to expand and improve the existing services.

Figure 2 “Standard practice” versus “current practice” models



Adaptation and local data requirements

While it is technically possible to obtain a rough cost estimate of the *Mother-Baby Package* by running the model with the data input provided by WHO, the user will achieve much more meaningful results if the model is adapted to reflect local conditions. This is done by replacing the “seed” values (which appear as red and blue cells on the worksheets) with values specific for the country or district under study, as shown in Table 4.

Table 4 Changing data cells in the worksheets to reflect local conditions

	Action	Explanation
RED DATA CELLS	The content of these cells should be replaced with local estimates	The values contained in these cells—population, birth rates, etc.—vary widely from country to country and from district to district. To arrive at a realistic estimate of the cost of implementing the <i>Mother-Baby Package</i> locally, the generic values in these red cells must be replaced with local data
BLUE DATA CELLS	A rigorous analysis would require local estimates for these data. However, a meaningful total cost estimate may result if some of these cells are not replaced with local estimates	In many cases, the values in these cells are similar across countries in similar situations
BLACK DATA CELLS	These cells contain formula, calculations, descriptions and should not be changed	

Types of data required

The types of information that need to be collected to customize the *Mother-Baby Package Costing Spreadsheet* can be grouped into three main categories:

- a) demographic and epidemiological information,
- b) information about current treatment practice and the standard treatment guidelines,
- c) input costs (drug prices, salaries of medical and support personnel, building, equipment and supply costs).

Data sources

The data required by the model will come from several sources. Demographic and infrastructure data usually can be obtained from relevant national ministries or the district government(s). Facility-specific data, such as information about the current equipment and personnel situation, are best collected through a survey of randomly sampled health facilities in the district. These facilities will also be the best source for an assessment of the type of maternal interventions currently provided (current treatment practice). These data can then be compared with the interventions and treatment protocol provided by the *Mother-Baby Package* or the national guidelines.

Information on the local costs can be obtained either from the Ministry of Health (clinical staff salaries, drug prices), or local contractors and stores (construction and equipment costs).

The model comes complete with two data forms to make the task of collecting the required data as easy as possible. One is the facility “Data Collection Form” which should be used to collect data at

the facility level. The other is the “Data Consolidation Form”. It should be of help in gathering and preparing all the data input required by the model.

The data collection forms are organized by a worksheet and follow the format used in the model. The user should gather all the required data before beginning data entry in the model.

A sample timetable for a district-specific study

No two applications of the *Mother-Baby Package Costing Spreadsheet* will be exactly the same. However, to assist in planning, a sample timetable, shown in Table 5, has been prepared based on the experience gained in using the spreadsheets in several countries.

Table 5 Sample three-month timetable for a district-specific study

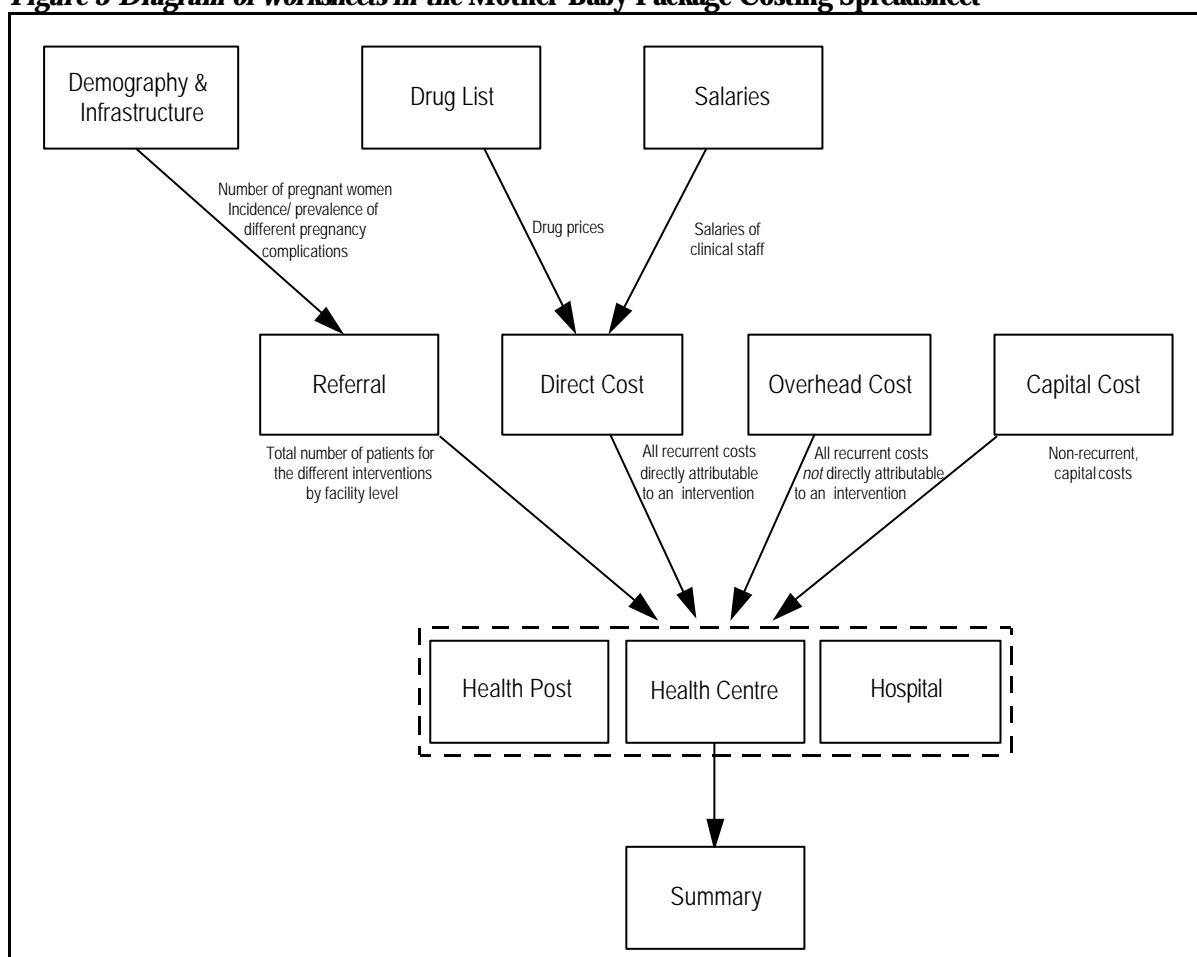
Week	Activity
0	Decision is made to carry out costing study using <i>Mother-Baby Package Costing Spreadsheet</i> methodology
0	Set timetable and workplan for study, prepare and secure budget
1	Identify districts to be studied
1-4	Gather existing data: <ul style="list-style-type: none"> • national maternal and newborn clinical management guidelines • salary cost information (from Ministry of Health or Planning) • local drug and supply costs (from Essential Drugs Programme) • demographic information (from Ministry of Health or Planning, DHS) • epidemiological information, incidence data • family planning prevalence and method mix information • any other information needed for local adaptation of spreadsheet
1-4	Adapt data collection forms to match national maternal and newborn clinical treatment guidelines and other expected practices
1-4	Test data collection forms in a facility not included in the sample
5	Collect data in the field (approximately one week per district)
7	Consolidate data collected using “data consolidation form” (one per district)
8-9	Input consolidated data into current practices model
8-9	Develop a standard practice model, based on national maternal and newborn clinical treatment guidelines and information from data consolidation forms
10-11	Use “graph” file to calculate incremental cost and to prepare charts
10-11	Prepare preliminary analysis
12	Complete draft report

Part II. The worksheets

Part II provides a more detailed description of the different worksheets, the calculations they perform and how they interrelate with each other. It also includes a discussion on the data needed to complete the different worksheets, where to obtain such data and how to estimate a proxy if no local data exist.

The *Mother-Baby Package Costing Spreadsheet* is an Excel “workbook” consisting of a series of linked “worksheets”. The overall structure of the spreadsheet is shown in Figure 3. The worksheets are designed in such a way that a change to one data cell in any single worksheet will result in the automatic recalculation of all other data cells in all of the other worksheets. For example, if the “crude birth rate” cell in the demography worksheet is increased, the number of clients will rise in the other worksheets, and the total cost in the “summary” worksheet will increase as well.

Figure 3 Diagram of worksheets in the Mother-Baby Package Costing Spreadsheet



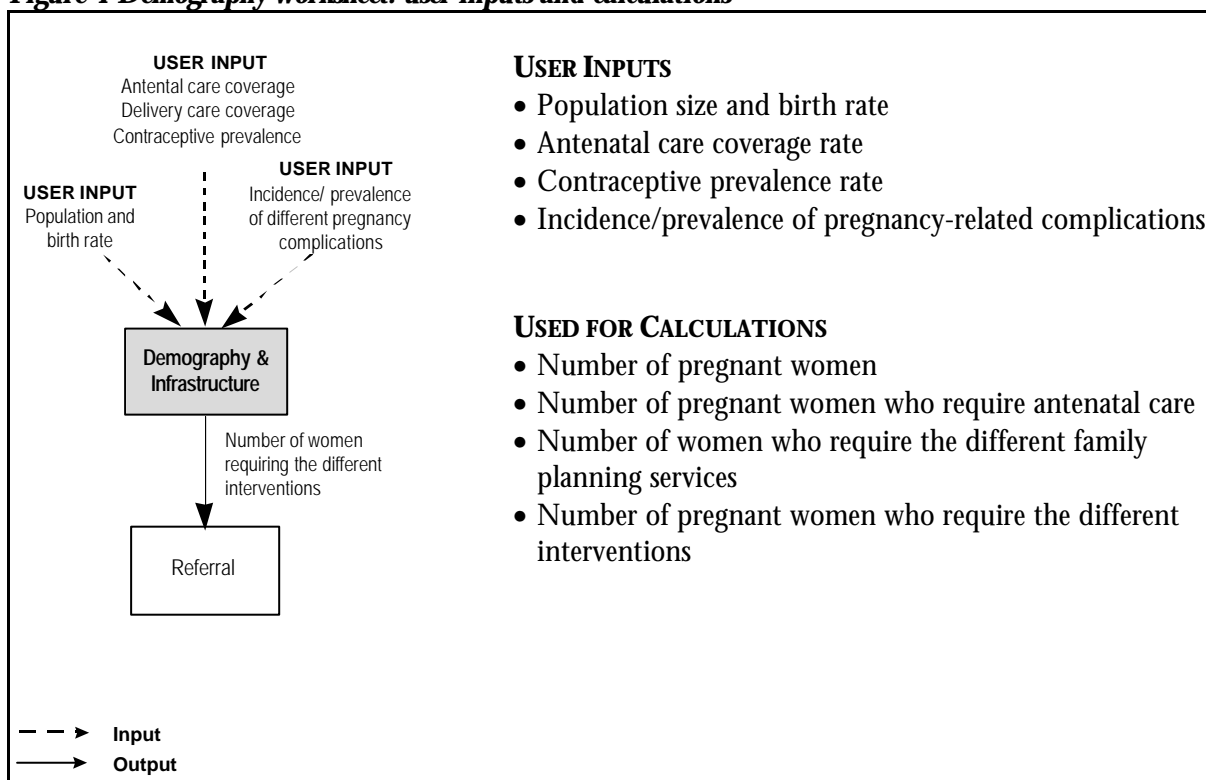
The above diagram shows the component worksheets of the model and how they interrelate. The top three worksheets will require the most input from the user. The information in these worksheets forms the basis of most of the calculations performed on all the other worksheets of the model. The worksheets in the second row require some user input but for their calculations resort mainly to information provided by the top three worksheets. The last four worksheets do not require any input from the user, since they are based on the information from preceding worksheets. A more thorough discussion of the formulae and functions used in the model is shown in Appendix B.

Demography worksheet

The demography worksheet, described in Figure 4, and shown in Screen printout 1 on page 11, is one of the most important worksheets in the model. A large number of calculations on the other worksheets will be based on the information provided here.

The user will be required to enter demographic and infrastructure information, such as the size of the population, the birth rate and the number of existing health facilities. Another major input will be the antenatal care coverage rate, contraceptive prevalence and estimates of the incidence/prevalence of the individual complications associated with pregnancy, which will be used to estimate the number of women who will require the different interventions.

Figure 4 Demography worksheet: user inputs and calculations



Current and standard models. This worksheet will be slightly different in the two models. Some of the cells that require user input in the current model are calculated automatically in the standard model and vice versa. The number of facilities in the current model, for instance, has to be input by the user. In the standard model, the corresponding cells will automatically calculate how many facilities will be required to deal with the predicted number of clients.

The following instructions will explain in detail the kind of data needed for the completion of this worksheet (for the current model as well as the standard model) and where and how to obtain these data.

Screen printout 1 Demography worksheet

POPULATION

	Abbreviation in formula	
District population	Population	500,000
Crude birth rate (per 1000)	CBR	34.0
Number of births	Births	17,000
Number of pregnancies	Pregnancies	18,700

COVERAGE RATES

Percent of women receiving antenatal care	Antenatal Care	90%
Percent of deliveries performed by a skilled medical attendant	Attended Delivery	50%
Contraceptive prevalence rate	CPR	30%

PREVALENCE/INCIDENCE OF COMPLICATIONS

Percent of pregnancies requiring management of severe anaemia	Anaemia	2.0%
Percent of pregnant women requiring treatment for syphilis	STD - Syphilis	3.0%
Percent of pregnant women requiring treatment of STDs other than syphilis (gonorrhoea, chlamydia etc.)	STD - Other	10.0%
Percent of pregnancies requiring management of incomplete abortion	Abortion complications	5.0%
Percent of births requiring management of eclampsia	Eclampsia	0.5%
Percent of births requiring management of postpartum haemorrhage	Haemorrhage	5.0%
Percent of births complicated by obstructed labour/requiring caesarean	Obstructed	5.0%
Percent of births requiring management of puerperal sepsis	Sepsis	8.0%
Percent of babies suffering from complications	Neonatal Complications	20.0%

FAMILY PLANNING METHOD MIX*

Percent of women choosing condoms	FP - Condom	10.0%
Percent of women choosing Depoprovera	FP - Depoprovera	40.0%
Percent of women choosing IUDs	FP - IUD	5.0%
Percent of women choosing Norplant	FP - Norplant	1.0%
Percent of women choosing oral contraceptives	FP - Pill	24.0%
Percent of women choosing sterilization	FP - Sterilization	20.0%
Total *		100.0%

* Should add up to 100%.

INFRASTRUCTURE

	Health Posts	Health Centres	Hospitals	Total
Number of facilities	50	20	2	72
Percentage of all facility contacts at this level that are maternal health-related	50%	30%	20%	—
Percentage of women who first seek care at this level	50%	35%	15%	100%
Percentage of women who actually receive care at this level	36%	41%	23%	—
Number of women who receive care at this level	19 235	21 651	11 993	52 879
Total number of maternal health-related contacts	50 006	60 696	51 509	162 211
Avg. number of maternal health-related contacts per facility <i>per year</i>	1 000	3 035	25 755	—
Avg. number of maternal health-related contacts per facility <i>per day</i>	4	12	71	—
Total number of contacts (maternal health and other)	100 012	202 320	257 545	559 877
Capacity: contacts per facility <i>per year</i> (maternal health and other)	2 000	10 000	125 000	—
Capacity: contacts per facility <i>per day</i> (maternal health and other)	8	38	342	—

Population

District population and crude birth rate are usually available from in-country data sources. Numbers might not exist for the birth rate on a district level, in which case one can use the national birth rate as a proxy. The number of births is derived using the formula in Equation 1.

Screen printout 2 Population (demography worksheet)

POPULATION		
	Abbreviation in formula	
District population	Population	500,000
Crude birth rate (per 1000)	CBR	34.0
Number of births	Births	17,000
Number of pregnancies	Pregnancies	18,700

Equation 1 Estimating number of births from crude birth rate

Births
Crude birth rate

Population x 1000

The number of pregnancies will actually be higher than the number of births, since not all pregnancies are carried to term. A certain percentage of pregnancies will end in spontaneous or induced abortions and thus not result in a live birth. The model currently assumes that there are 10% more pregnancies than births.

Equation 2 Estimating number of pregnancies

Pregnancies
Number of births x 1.1

If the abortion or incomplete pregnancy rate is very high in a country, the multiplication factor (1.1) can be adjusted upward to account for this fact.

Coverage rate for maternity services

Antenatal care and delivery service coverage will be different for the two models. In the current practice model, this will be an estimate of the current coverage rate: an estimate of the percentage of pregnant women that are currently receiving antenatal care or delivery services from the district’s health system.

Screen printout 3 Coverage rates (demography worksheet)

COVERAGE RATES		
Percent of women receiving antenatal care	Antenatal Care	90%
Percent of deliveries performed by a skilled medical attendant	Attended Delivery	50%
Contraceptive prevalence rate	CPR	30%

Since the model results will be very sensitive to the coverage rates, it is important to obtain a realistic local estimate of the current coverage in the district. Table 6 gives an overview of the coverage rates for different regions. Since there are wide variations from country to country, the user might also consult the country estimates given in Appendix C.

Table 6 Antenatal and delivery care coverage rates in selected regions

	Antenatal care (%)	Skilled attendant at delivery (%)	Delivery in health facility (%)
Africa	63	42	36
Eastern Africa	66	34	32
Middle Africa	58	42	41
Northern Africa	56	63	39
Southern Africa	89	79	76
Western Africa	60	34	32
Asia*	65	53	37
Eastern Asia*	80	86	54
South-Central Asia	52	34	26
South-Eastern Asia	79	53	33
Western Asia	61	68	57
Latin America and the Caribbean	73	75	71
Caribbean	88	71	70
Central America	70	65	58
South America	73	80	78
Oceania	73	75	71

*Excluding Japan.
Source: WHO. *Coverage of maternity care: A listing of available information*. Geneva, World Health Organization, 1996.

Since the provision of quality antenatal care and clean and safe delivery care are two of the main goals of the *Mother-Baby Package*, the target coverage rates in the “standard” model should be set as high as realistically possible, perhaps to 90 or 95%.

Table 7 Contraceptive prevalence rates in selected regions

	Any method (%)	Modern methods (%)
Africa	18	14
Northern Africa	38	36
Sub-Saharan Africa	12	8
Asia and Oceania	58	53
Eastern Asia*	79	79
South-Central Asia	41	35
South-Eastern Asia	49	41
Western Asia	41	24
Latin America and the Caribbean	58	49

*Excluding Japan.
Source: United Nations, Dept. for Economic and Social Information and Policy Analysis, Population Division: *Levels and trends of contraceptive use as assessed in 1994*. New York, United Nations, 1996.

Contraceptive prevalence in the current model should reflect the percentage of women who are currently using modern contraceptive methods. Data on contraceptive prevalence in a country can be found at the Ministry of Health or other relevant government sources or from NGOs active in family planning service provision. If no national data are available, information from *Levels and trends of contraceptive use*, which is published periodically by the Population Division of the United Nations,⁶ might be a useful source of data (Table 7).

⁶ United Nations, Department for Economic and Social Information and Policy Analysis, Population Division. *Levels and trends of contraceptive use as assessed in 1994*. New York, United Nations, 1996.

Contraceptive prevalence in the standard model should reflect the contraceptive prevalence planner's aim to achieve with the implementation of the *Mother-Baby Package*. Two factors should be considered when determining this number. The first is current utilization. The second is the number of women who are interested in using contraceptives, but for whatever reason, are not using them. In most developing countries, the number of women who are interested in contraceptives will exceed the number of women who are actually using contraceptives. An indication of the percentage of women who would be interested in family planning is obtained from the numbers published in Demographic and Health (DHS) country surveys, shown in Table 8. These surveys assess how many women do not want any more children or would like to postpone their next pregnancy.

Table 8 Demand for family planning among married women, selected countries, 1990-1994

Country	Total unmet need (%)	Women wishing to postpone (%)	Women wishing to have no more children (%)
Sub-Saharan Africa			
Burkina Faso	32.6	24.1	8.5
Cameroon	21.7	17.3	4.4
Ghana	33.0	23.8	9.2
Kenya	35.5	22.2	13.3
Madagascar	32.5	17.3	15.1
Malawi	35.6	26.4	9.2
Namibia	21.8	15.2	6.6
Niger	18.7	16.4	2.3
Nigeria	21.6	16.9	4.8
Rwanda	36.9	24.0	12.9
Senegal	29.3	22.6	6.6
Sudan (Northern)	25.5	18.0	7.4
United Republic of Tanzania	27.3	19.2	8.1
Zambia	30.7	23.1	7.6
Near East/North Africa			
Egypt	21.9	7.4	14.5
Jordan	21.8	10.1	11.8
Morocco	19.7	8.7	11.0
Turkey	11.2	3.7	7.5
Asia			
Bangladesh	18.0	10.1	7.9
Indonesia	14.1	7.9	6.2
Pakistan	31.7	17.0	14.7
Philippines	25.9	12.6	13.3
Latin America and the Caribbean			
Bolivia	23.5	6.1	17.4
Colombia	11.6	4.2	7.4
Dominican Republic	17.1	8.8	8.3
Paraguay	15.2	8.1	7.1
Peru	15.7	4.3	11.4

Source: Westoff CF, Bankole A. *DHS comparative studies No. 16: Unmet need: 1990-1994*. Calverton, MD, Macro International, Inc., 1995.

Combining the information about current usage and unmet contraceptive needs in a country should help in establishing a realistic target coverage rate.

Incidence and prevalence of pregnancy-related complications

Information on the incidence and prevalence of pregnancy-related complications may be available from the Ministry of Health or from national surveys. Alternatively, estimates may be derived from data specific to a particular region or health facility and extrapolated to the regional or national context. To arrive at an estimate of the incidence of different complications, the user might look at hospital discharge records over six months to find what percentage of deliveries at that facility required management of those complications. A third, though less desirable, method would be to use the sample numbers supplied in the spreadsheet.

Screen printout 4 Incidence and prevalence of complications (demography worksheet)

PREVALENCE/INCIDENCE OF COMPLICATIONS

Percent of pregnancies requiring management of severe anaemia	Anaemia	2.0%
Percent of pregnant women requiring treatment for syphilis	STD - Syphilis	3.0%
Percent of pregnant women requiring treatment of STDs other than syphilis (gonorrhoea, chlamydia etc.)	STD - Other	10.0%
Percent of pregnancies requiring management of incomplete abortion	Abortion complications	5.0%
Percent of births requiring management of eclampsia	Eclampsia	0.5%
Percent of births requiring management of postpartum haemorrhage	Haemorrhage	5.0%
Percent of births complicated by obstructed labour/requiring caesarean	Obstructed	5.0%
Percent of births requiring management of puerperal sepsis	Sepsis	8.0%
Percent of babies suffering from complications	Neonatal Complications	20.0%

The user will need to provide these numbers for both models in the demography worksheet, one depicting the current situation (current model) and the other depicting the desired, optimal situation after implementation of the *Mother-Baby Package* (standard model). Many of the numbers in this section will be similar for the two models, because the provision of better care to pregnant women will often only over a longer period of time lead to a decreased incidence of complications. The incidence of certain complications, like obstructed labour, will probably not change at all for the simple reason that they depend more on the mechanics of childbirth than on the quality of care or the health system.

Percent of women with severe anaemia

WHO estimates that more than half the pregnant women in the world have a haemoglobin level indicative of anaemia. For developing countries only, the figure is 56% or 61% if China is excluded. For this reason, the *Mother-Baby Package* states that all women should be given preventive iron and folate supplements during antenatal care. In addition to this, the spreadsheet intervention entitled "Anaemia" provides treatment for the very severe cases of anaemia, defined as having a haemoglobin level under 7 g/dl.

While there are often data available on a country basis, these surveys often do not differentiate between mild and severe anaemia. If this is the case, the data shown in Table 9 can provide a rough guideline.

Table 9 Estimated prevalence of severe anaemia* in pregnant women in selected regions

	% of pregnant women
Africa	
Eastern Africa	4
Middle Africa	5
Northern Africa	3
Southern Africa	2
Western Africa	4
Asia	
South-Eastern Asia	5
South-Central Asia	7
Western Asia	2
Latin America and the Caribbean	
Caribbean	2
Central America	2
South America	1
* Severe anaemia is defined as less than 70 g/l. Source: Murray CJL, Lopez AD, eds. <i>Health dimensions of sex and reproduction, Vol. VIII, Malnutrition and the burden of disease.</i> (Forthcoming)	

Percent of pregnant women requiring treatment of syphilis

WHO estimates that between 150 to 330 million curable sexually transmitted diseases occur annually, more than half of which are among women of reproductive age. STDs not only cause acute morbidity, complications and sequelae, but also contribute to foetal mortality and adverse pregnancy outcome. For example, in a study in Zambia, it was found that 18% of early foetal deaths and 43% of late foetal deaths were attributed to syphilis. Information on the prevalence of syphilis among pregnant women in several countries is found in Table 10.

Table 10 Prevalence of syphilis among pregnant women

Country	Prevalence (%)
Brazil	16.0
Zambia	12.8
Chile	3.4
Nigeria	1.9
India	1.4
Source: WHO. <i>Maternal and perinatal infections: a practical guide.</i> Geneva, World Health Organization, 1991.	

Percent of pregnant women requiring treatment of other STDs

The intervention “STD—Other” includes the treatment of all STDs other than syphilis—gonorrhoea, chlamydia, and other vaginal and cervical infections. Information on the prevalence of gonorrhoea and chlamydia among pregnant women in several countries is found in Table 11.

Table 11 Prevalence of gonorrhoea and chlamydia among pregnant women

Country	Prevalence (%)	Year of study
Gabon	5.5	1984
Kenya	6.5	1986
South Africa	11.7	1985
Thailand	11.9	1981

Source: WHO. *Maternal and perinatal infections: a practical guide*. Geneva, World Health Organization, 1991.

Data on the national or regional incidence of syphilis and other STDs should be available from the Ministry of Health or DHS surveys.

Percent of pregnancies requiring management of abortion complications

Every year almost 76,000 women die globally following complications of unsafe abortion. Abortion-related deaths account for between 10% and 50% of all maternal deaths, depending on the country. Many deaths could be prevented if women were able to avoid unwanted pregnancy through access to family planning services. A substantial further reduction in maternal deaths can be achieved if complications due to unsafe abortions are prevented or recognized early and treated appropriately.

Given the stigma attached, country data on the incidence of induced abortion is often hard to find. Even harder to find are data on the incidence of abortion complications. If no data exist, one might simply have to estimate what percentage of pregnancies in the area under study end in abortion. While abortions that are legally sanctioned and performed at licensed health facilities generally have very low complication rates, illegal abortions, especially those not performed in medical facilities, usually have a very high incidence of complications. Table 12 shows some WHO estimates about the incidence of unsafe abortions by geographical regions.

Table 12 Unsafe abortion in selected regions

	Unsafe abortions (% of births)	Unsafe abortions (% of pregnancies*)
Africa	16	14
Eastern Africa	19	15
Middle Africa	14	12
Northern Africa	13	11
Southern Africa	13	11
Western Africa	16	14
Asia	13	11
Eastern Asia**	Negligible	Negligible
South-Central Asia	17	14
South-Eastern Asia	23	18
Western Asia	11	9
Latin America and the Caribbean	36	26
Caribbean	21	17
Central America	26	20
South America	42	29

*Estimated as the number of births, abortions and estimated spontaneous abortions of 13 weeks of gestation or more.
 **Excluding Japan.
 Source: WHO. *Unsafe abortion: Global and regional estimates of incidence of and mortality due to unsafe abortion, with a listing of available country data*. Geneva, World Health Organization, 1998 (WHO/RHT/MSM/97.16).

As can be seen in Equation 3, there are two different ways of calculating the abortion complication rate. It can be calculated as a percent of live births, or as a percent of pregnancies. The rate of

abortions per live birth is always higher than the ratio of abortions per pregnancy. This is due to the fact that the first denominator includes only those pregnancies that result in a live birth, while the latter denominator includes all pregnancies (those that result in live births as well as all pregnancies that are not carried to term or result in a still birth).

Equation 3 Alternative methods for calculating abortion complication rate

Abortion complication rate per live birth	Abortion complication rate per pregnancy
Abortions	Abortions
—————	—————
Live births	Live births + induced abortions + stillbirths

The input required by the model is the abortion complication rate per *pregnancy*, not per *live birth*. It should be noted that the model does not require information on the incidence of induced abortion—what is needed is information on abortion *complications*. In the absence of better information, the abortion complication rate can be estimated using the incidence of induced abortion, multiplied by the percentage of these induced abortions that are thought to develop complications.

Percent of births requiring management of eclampsia

While eclampsia occurs in less than 1% of pregnant women, it is a significant contributor to maternal deaths. WHO estimates that eclampsia and hypertensive disorders are the cause of 12% of all maternal deaths. While there are some variations in the incidence between different regions and countries, as a rule of thumb, one can assume that it will occur in less than 1% of all pregnancies. On average, eclampsia will occur in about 0.5% of all pregnancies. If no data are available on the target population, that number should be used. Data from country studies on eclampsia are shown in Table 13.

Table 13 Estimated incidence of eclampsia in pregnant women in selected regions

	Incidence (%)
China	0.17
Vietnam	0.34
Burma	0.40
Thailand	0.93
Egypt	0.20
Lesotho	1.14
Botswana	0.14
Source: <i>Mother-Baby Package</i> , p. 32.	

Percent of births requiring management of postpartum
haemorrhage

In most developing countries, haemorrhage is the leading cause of maternal death; by one estimate, haemorrhage accounts for 17-46% of maternal deaths in selected developing countries.⁷ The incidence of haemorrhage does not show any real variations between countries. WHO estimates that postpartum haemorrhage incidence is about 10% globally.

⁷ Jamison D et al., eds. *Disease control priorities in developing countries*. New York, Oxford University Press, 1993, page 366.

Percent of births requiring management of obstructed labour/caesarean delivery

Prolonged and/or obstructed labour accounts for about 8% of direct maternal deaths in developing countries. It can be said that one might expect little variability in the occurrence of obstructed labour for the simple reason that it results more from the mechanics of childbirth than from the quality of prenatal care or nutrition. As a rough estimate, WHO has estimated that caesarean delivery might be necessary in 5-15% of all deliveries.

Percent of births requiring management of sepsis

Sepsis is defined as an infection of the genital tract occurring at any time between the onset of the rupture of the membranes or labour and the forty-second day postpartum. Sepsis, if left untreated, is an important cause not only of mortality but may lead to disabilities and infertility. WHO estimates that sepsis occurs in 8% of pregnancies globally, but accounts for 15% of all maternal deaths. Unclean delivery practice, prolonged rupture of membranes and/or labour are important factors in the development of subsequent sepsis. The presence of sexually transmitted diseases will increase the risk of puerperal sepsis.

Percent of births requiring management of newborn complications

Perinatal death remains an enormous problem in the developing world. For every 1,000 babies born in developing countries, anywhere from 40 to 90 will be stillborn or will not survive the first week; regional estimates vary widely. The main causes of perinatal mortality include birth asphyxia, bacterial infections, congenital syphilis, and pre-term birth. While newborn deaths are fairly well tracked, morbidity resulting from perinatal problems is difficult to quantify. A few studies have examined the incidence of newborn complications. In one such study in Madras, India, a maternity hospital with "efficient obstetric and paediatric care" found 20% of all births affected by newborn complications with 4% ending in death.⁸

The user might want to use 20% as a mid-range estimate for the percentage of births that will require management of newborn complications. Several factors will influence this number. A highly efficient health care system, accessible to large parts of the population, will significantly reduce it. A high incidence of STDs among the population, on the other hand, will increase the number of complications.

Demand for different family planning methods

Like the contraceptive prevalence rate, the contraceptive method mix varies widely among countries. In the absence of country-specific information on contraceptive method mix, Table 14 can be used to give an overview of the method mix for different regions. Since there are wide variations from country to country, the user might also consult the United Nations country estimates shown in Appendix D.

⁸ Jamison D et al., eds. *Disease control priorities in developing countries*. New York, Oxford University Press, 1993, page 368.

Table 14 Contraceptive method mix in selected regions

	Modern methods (%)	Method mix (all modern methods = 100%)					
		Sterilization	Pill	Injectable	IUD	Condom	Other
Africa	14	7	42	14	28	7	2
Northern Africa	36	6	51	1	39	3	1
Sub-Saharan Africa	8	13	39	26	13	6	3
Asia	53	43	8	2	30	6	11
Eastern Asia*	79	42	4	0	39	3	13
South-Central Asia	35	54	11	0	6	14	14
South-Eastern Asia	41	17	27	20	32	2	2
Western Asia	24	8	25	1	45	17	4
Latin America and the Caribbean	49	43	33	2	14		4

*Excluding Japan.
 Source: United Nations, Department for Economic and Social Information and Policy Analysis, Population Division. *Levels and trends of contraceptive use as assessed in 1994*. New York, United Nations, 1996.

Standard: To arrive at estimates of the number of women who will be interested in the different methods when coverage is expanded, one should look at the current contraceptive mix in the country or district. It would be reasonable to assume that new users will opt for the different methods in roughly the same proportions. If plans exist to influence the contraceptive mix in a specific way, for instance, to promote the use of a certain method, this should be reflected in the numbers chosen here. The extent to which policy decisions influence the contraceptive mix is, however, limited.

Infrastructure, facility utilization, care-seeking behaviour

INFRASTRUCTURE

	Health Posts	Health Centres	Hospitals	Total
Number of facilities	50	20	2	72
Percentage of all facility contacts at this level that are maternal health-related	50%	30%	20%	–
Percentage of women who first seek care at this level	50%	35%	15%	100%
Percentage of women who actually receive care at this level	36%	41%	23%	–
Number of women who receive care at this level	19 235	21 651	11 993	52 879
Total number of maternal health-related contacts	50 006	60 696	51 509	162 211
Avg. number of maternal health-related contacts per facility <i>per year</i>	1 000	3 035	25 755	–
Avg. number of maternal health-related contacts per facility <i>per day</i>	4	12	71	–
Total number of contacts (maternal health and other)	100 012	202 320	257 545	559 877
Capacity: contacts per facility <i>per year</i> (maternal health and other)	2 000	10 000	125 000	–
Capacity: contacts per facility <i>per day</i> (maternal health and other)	8	38	342	–

Screen printout 5 Infrastructure, facility utilization, care-seeking behaviour (demography worksheet)

Number of health posts, health centres, hospitals

Current: Here the user should enter the current number of facilities at each level.

Standard: No entry is necessary for the standard model. The cell contains a formula that calculates how many facilities will be necessary to accommodate the projected number of visits. It does so by dividing the total number of visits to health posts, for instance, by the number of visits the average health post can handle. The formula will automatically round up the result. If there are, for instance, a projected number of 4,400 visits at the health post level, and the average health post can handle 1,000 a year, the formula will calculate a required number of five health posts.

Percentage of all facility contacts that are maternal health-related

Only a certain percentage of the total number of visits a health post, health centre or hospital handles is maternal health-related. For that reason, only a certain share of the total capital and overhead cost incurred at those facilities should be allocated to the maternal health programme. If maternal health services make up 50% of the total client load at a health post (the rest consisting of child and general health services), then maternal health should be responsible for just 50% of capital and overhead cost incurred at the health post. The more other services are provided by the facility, the smaller the share of maternal health will be.

Current: The health facility manager or, at a smaller facility, the medical staff will probably be able to provide a reasonable estimate.

Standard: Assuming that the implementation of the *Mother-Baby Package* will lead to an overall increase in maternal visits one might want to raise this share.

Percentage of women who first seek care at this level

This number is used to distribute the total number of pregnant women who seek care in the health system across the different levels of the health system (health post, health centre and hospital). Depending on whether the intervention they are seeking can be provided at that level, they either receive care at that level or are referred to a higher level in the system. Are many clients entering the health system at the lower level, the health posts, or are they going straight to the hospital? Due to the fact that several of the interventions can only be provided at the hospital, the percentage who actually receive care at the health post level will be smaller than the percentage who originally sought care there and the number at the health centre and hospital level will be higher.

The estimates of the share that is maternal health-related and the modelling of care-seeking behaviour can be cross-checked against the results they produce in rows 19 through 24 of the demography worksheet. These cells calculate the average annual and daily number of visits (maternal and other) that a single facility receives based on the information provided by the user. The numbers in these rows might be easier to verify than the input in the two rows above. It should, for instance, be possible to obtain at least some information on the average capacity of a typical health post, health centre or hospital. If annual data are not available, a staff member of the facility might be able to estimate the average daily number of maternal and other visits, which then can be used to estimate the annual number. The Ministry of Health might have utilization statistics detailing what percentage of medical care (or even maternal care) is provided at what level of health system.

The two inputs—percentage of total contacts that are maternal health-related and percentage of women who first seek care at the different levels—should be fine-tuned until all the numbers in the following row match whatever information the user is able to find on facility capacity and utilization.

Average number of contacts per facility

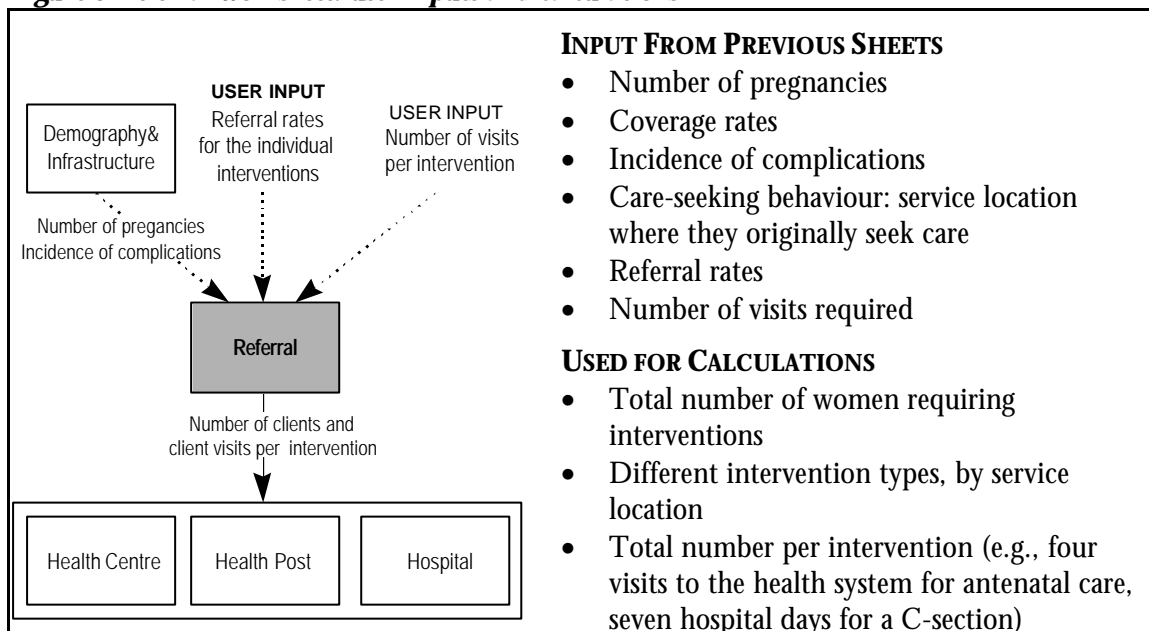
Current: No user entry is necessary for the current model. In the current model, these cells will calculate the average number of visits per facility by dividing the total number of patient visits (calculated on the referral worksheet) by the number of existing facilities.

Standard: In the standard model, this number has to be entered by the user. In its determination, the user should consider the current utilization numbers. If the health facilities are working below capacity and could obviously handle more patients than they are currently handling, this number can be increased. If the facilities are already working above capacity, the planner might wish to decrease this number in order to allocate more time to the individual patient and thus improve quality of care.

Referral worksheet

The referral worksheet, described in Figure 5 below and shown in Screen printout 6 on page 23, uses data from the demography worksheet to calculate the total number of clients for each of the interventions. It then allocates them to the different levels of the health care system.

Figure 5 Referral worksheet: user inputs and calculations



The calculation of the number of clients who require the different interventions is based on the information on the demography worksheet. The calculation uses the total number of pregnancies, the prevalence/incidence of pregnancy complications and coverage rates to arrive at the estimates. If there are, for instance, a total number of 10,000 pregnancies in the district and the antenatal care coverage is 90%, then 9,000 women will need antenatal care. If the prevalence of STDs among the population is 5%, then 500 women will require STD treatment. This number is then adjusted according to the coverage rate, i.e., the percentage of women actually seeking care in the health system.

The total number of cases will be larger than the total number of pregnant women, since the interventions are not mutually exclusive. A woman might require antenatal care as well as treatment for syphilis and later, while giving birth, clean and safe delivery service as well as management of haemorrhage.

Screen printout 6 Referral worksheet

REFERRAL RATES AND NUMBER OF CONTACTS BY INTERVENTION

HEALTH POST

	Originally seeking care at HP	Referral to HC	Referral to Ho	Actually treated (%)	Actually treated (Number)	Average number of contacts per case	Total number of contacts
Abortion Complications	421	50%	50%	--	--	--	--
Anaemia, severe	168	75%	25%	--	--	--	--
Antenatal Care	8,415	--	--	100%	8,415	4	33,660
Eclampsia	21	--	100%	--	--	--	--
FP - Condom	281	--	--	100%	281	4	1,124
FP - Depoprovera	1,122	--	--	100%	1,122	--	--
FP - IUD	140	100%	--	--	--	--	--
FP - Norplant	28	100%	--	--	--	--	--
FP - Oral Contraceptives	673	--	--	100%	673	4	2,692
FP - Sterilization	561	--	100%	--	--	--	--
Haemorrhage	213	--	100%	--	--	--	--
Neonatal Complications	850	--	100%	--	--	--	--
Normal Delivery Care	4,250	100%	--	--	--	--	--
Obstructed Labour	213	--	100%	--	--	--	--
Postpartum Care	7,650	--	--	100%	7,650	1	7,650
Sepsis	340	50%	50%	--	--	--	--
STD - Other	842	--	--	100%	842	4	3,368
STD - Syphilis	252	--	--	100%	252	6	1,512
TOTAL	26,439				19,235		50,006

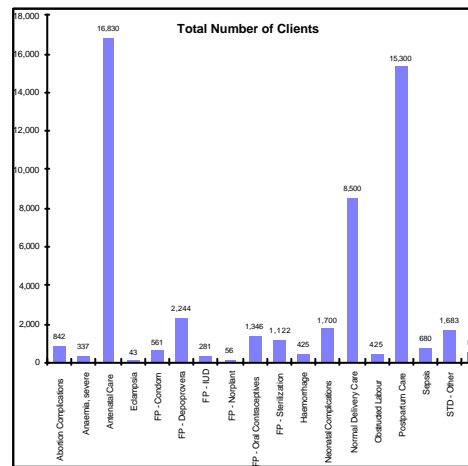
HEALTH CENTRE

	Originally seeking care at HC	Referrals from HP	Total at HC	Referral to Ho	Actually treated (%)	Actually treated (Number)	Average number of contacts per case	Total number of contacts
295	210	505	50%	50%	252	2	504	
118	126	244	25%	75%	183	2	366	
5,891	--	5,891	--	100%	5,891	5	29,455	
15	--	15	100%	--	--	--	--	
196	--	196	--	100%	196	4	784	
785	--	785	--	100%	785	4	3,140	
98	140	238	--	100%	238	3	714	
20	28	48	--	100%	48	3	144	
471	--	471	--	100%	471	4	1,884	
393	--	393	100%	--	--	--	--	
149	--	149	75%	25%	37	2	74	
595	--	595	100%	--	--	--	--	
2,975	4,250	7,225	--	100%	7,225	2	14,450	
149	--	149	100%	--	--	--	--	
5,355	--	5,355	--	100%	5,355	1	5,355	
238	170	408	50%	50%	204	2	408	
589	--	589	--	100%	589	4	2,356	
177	--	177	--	100%	177	6	1,062	
18,507	4,925	23,432			21,651		60,696	

HOSPITAL

	Originally seeking care at Hospital	Referrals from HP and HC	Actually treated (Number)	Average number of contacts per case	Total number of contacts
126	463	589	4	2,356	
50	103	154	3	462	
2,525	--	2,525	6	15,150	
6	36	43	7	301	
84	--	84	4	336	
337	--	337	4	1,348	
42	--	42	3	126	
8	--	8	3	24	
202	--	202	4	808	
168	954	1,122	3	3,366	
64	324	388	7	2,716	
255	1,445	1,700	7	11,900	
1,275	--	1,275	2	2,550	
64	361	425	7	2,975	
2,295	--	2,295	1	2,295	
102	374	476	7	3,332	
252	--	252	4	1,008	
76	--	76	6	456	
7,932	4,060	11,993		51,509	

	HP	HC	Ho	Total Number of Clients	% of Total
Abortion Complications	--	252	589	842	1.6%
Anaemia, severe	--	183	154	337	0.6%
Antenatal Care	8,415	5,891	2,525	16,830	31.8%
Eclampsia	--	--	43	43	0.1%
FP - Condom	281	196	84	561	1.1%
FP - Depoprovera	1,122	785	337	2,244	4.2%
FP - IUD	--	238	42	281	0.5%
FP - Norplant	--	48	8	56	0.1%
FP - Oral Contraceptives	673	471	202	1,346	2.5%
FP - Sterilization	--	--	1,122	1,122	2.1%
Haemorrhage	--	37	388	425	0.8%
Neonatal Complications	--	--	1,700	1,700	3.2%
Normal Delivery Care	--	7,225	1,275	8,500	16.1%
Obstructed Labour	--	--	425	425	0.8%
Postpartum Care	7,650	5,355	2,295	15,300	28.9%
Sepsis	--	204	476	680	1.3%
STD - Other	842	589	252	1,683	3.2%
STD - Syphilis	252	177	76	505	1.0%
TOTAL	19,235	21,651	11,993	52,879	100.0%
% of Total	36.4%	40.9%	22.7%	100.0%	--



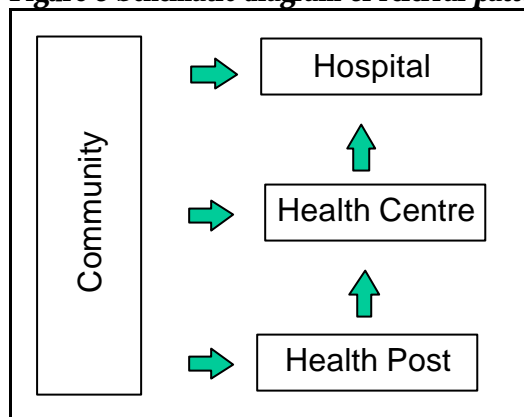
NUMBER OF CONTACTS

	HP	HC	Ho	Total Number of Contacts	% of Total
Abortion Complications	--	504	2,356	2,860	1.8%
Anaemia, severe	--	366	462	828	0.5%
Antenatal Care	33,660	29,455	15,150	78,265	48.2%
Eclampsia	--	--	301	301	0.2%
FP - Condom	1,124	784	336	2,244	1.4%
FP - Depoprovera	--	3,140	1,348	4,488	2.8%
FP - IUD	--	714	126	840	0.5%
FP - Norplant	--	144	24	168	0.1%
FP - Oral Contraceptives	2,692	1,884	808	5,384	3.3%
FP - Sterilization	--	--	3,366	3,366	2.1%
Haemorrhage	--	74	2,716	2,790	1.7%
Neonatal Complications	--	--	11,900	11,900	7.3%
Normal Delivery Care	--	14,450	2,550	17,000	10.5%
Obstructed Labour	--	--	2,975	2,975	1.8%
Postpartum Care	7,650	5,355	2,295	15,300	9.4%
Sepsis	--	408	3,332	3,740	2.3%
STD - Other	3,368	2,356	1,008	6,732	4.2%
STD - Syphilis	1,512	1,062	456	3,030	1.9%
TOTAL	50,006	60,696	51,509	162,211	100.0%
% of Total	30.8%	37.4%	31.8%	100.0%	--

Allocation to the different facility levels

After calculating the total number of cases, these cases are allocated to the different facility levels (health post, health centre, and hospital). Two factors determine the number of clients at each level: where women enter the health system and where treatment can be provided. Usually, a majority of women will enter the health system at one of the lower levels, the health post or health centre. If these facilities are not able to provide the treatment (if, for instance, surgery or a blood transfusion is required) then they will be referred to the next level of the health system. This flow of clients is illustrated in Figure 6.

Figure 6 Schematic diagram of referral patterns



Number of visits required for the different interventions

Here the user should fill in the number of visits that are required to properly provide each of the individual interventions. While for some interventions this number will be the same whether the intervention is performed at the health post, health centre or hospital, for some interventions the required number of visits will be different depending on the facility level. STD treatment is an example of an intervention where treatment is the same and can be provided at all levels and therefore the number of visits will be the same. For abortions complications or sepsis, the number of visits will be different because it is assumed that the health centre will treat the less severe cases and all more complicated cases which require extended treatment are referred to the hospital.

Referral rate for the different interventions

The referral rates given in the model are based on the assumptions outlined above regarding the equipment and competencies at the different levels of the health system. These assumptions, for instance, specified that a typical health post is staffed by just one auxiliary and has neither beds nor lab facilities. This, of course, has ramifications for the type of interventions that can be offered there.

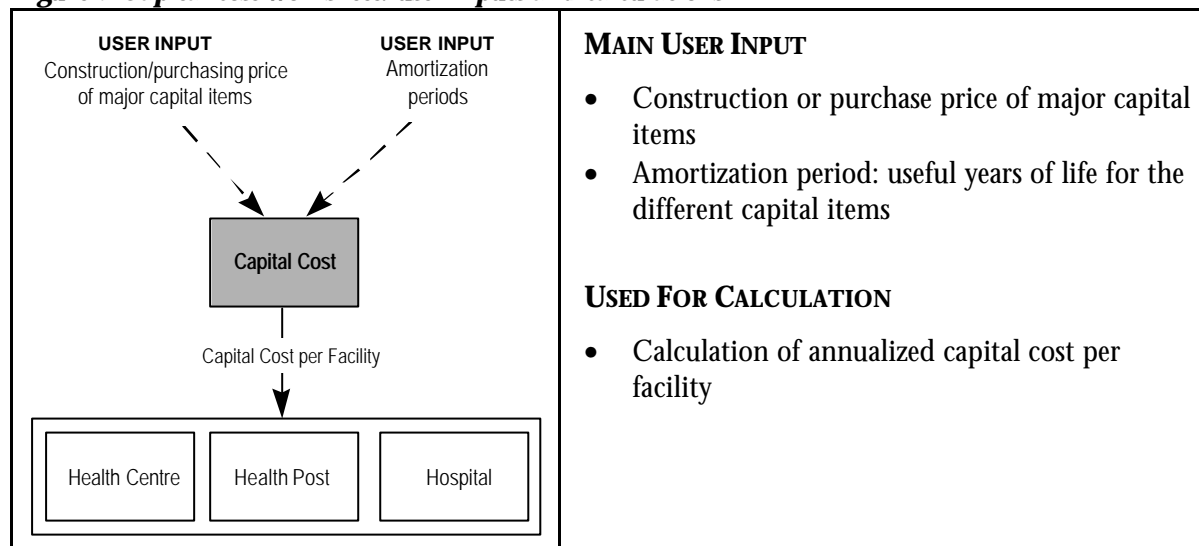
Current: The current referral patterns should be assessed in the facility surveys.

Standard: Before deciding on the ideal referral patterns for the different interventions in the standard model, the user should review the equipment and competencies of the different facilities to obtain a clearer picture of what kind of treatment can realistically be provided at a typical health post or health centre.

Capital cost worksheet

The capital cost worksheet, outlined in Figure 7 and shown in Screen printout 7 below, includes all major capital items that are required to provide maternal and newborn health services, including buildings, grounds, furniture, equipment and vehicles.⁹

Figure 7 Capital cost worksheet: user inputs and calculations



Screen printout 7 Annual capital cost (capital cost worksheet)

ANNUALIZED CAPITAL COST											
	Amortization period (years)	To be paid in US\$?	Health Post			Health Centre			Hospital		
			Estimated construction cost/purchasing price	MBP share	Annualized depreciation	Estimated construction cost/purchasing price	MBP share	Annualized depreciation	Estimated construction cost/purchasing price	MBP share	Annualized depreciation
Capital Cost											
Facilities	20		\$10,000	50%	\$250	\$100,000	30%	\$1,500	\$1,000,000	20%	\$10,000
Furniture and Beds	7		\$1,000	50%	\$71	\$10,000	30%	\$429	\$100,000	20%	\$2,857
Refrigerators, Coolers	7	x	\$1,250	50%	\$89	\$1,950	30%	\$84	\$2,800	20%	\$80
Examination & Surgery Equipment	5	x	\$500	100%	\$100	\$2,000	100%	\$400	\$20,000	100%	\$4,000
Communications Equipment	2	x	\$500	50%	\$125	\$1,000	30%	\$150	\$2,500	20%	\$250
Vehicles	7	x	\$400	50%	\$29	\$20,000	30%	\$857	\$50,000	20%	\$1,429
Other	2	x	\$0	50%	\$0	\$0	30%	\$0	\$0	20%	\$0
TOTAL			\$13,650		\$664	\$134,950		\$3,419	\$1,175,300		\$18,616

Capital items should be priced at replacement cost, not at the original purchase price. The replacement price should include all costs that would be incurred in purchasing the item now, i.e. not only the purchasing price but also duty, taxes, shipping and handling charges. In estimating building cost, market rental rates can be used as a proxy for the annual depreciation rate, if available. Possible sources for data on capital cost are shown in Table 15, and a listing of all equipment needed to provide the services described in the *Mother-Baby Package* is shown in Appendix E.

⁹ See also see Creese A, Parker D, eds. *Cost analysis in primary health care*. Geneva, World Health Organization, 1994.

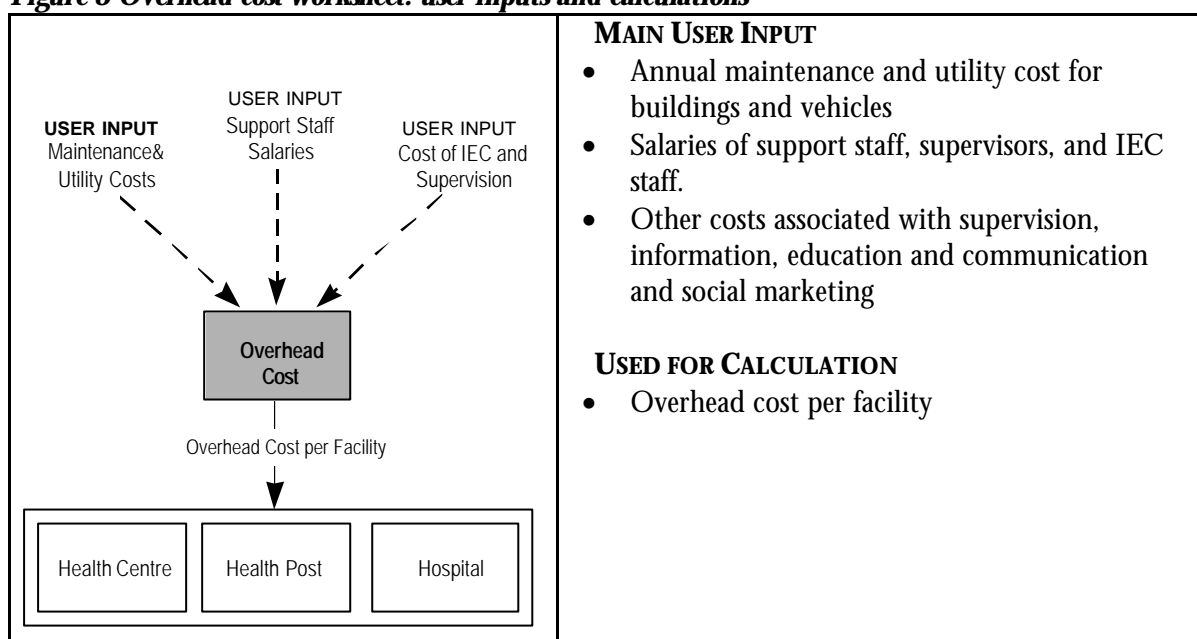
Table 15 Sources of data on capital cost

	Building	Furniture	Equipment	Vehicles
Cost basis	Current cost of land, site development, architect's fees, construction costs of building or estimates of costs per square metre for that type of building (current, not historical, cost) or annual market rent for that amount of space times number of years the building is expected to last	Itemized (at replacement cost, not original purchase price) or set at 10% of building cost	Replacement cost (The user is referred to the equipment list provided in the annex, which lists and costs all examination and surgery equipment needed for the implementation of an essential <i>Mother-Baby Package</i>)	Vehicles include bicycles, motorbikes, jeeps and ambulances that are used for the emergency transport of patients
Sources of information	Recent government contracts for similar buildings should be available from the planning division of the Health Department, or architects in the Ministry of Works, or from local construction companies. Market rents for similar buildings should be available from local real estate agents	Recent government contracts or local dealers	Recent government contracts or local dealers	Recent government contracts or local dealers
Useful life or amortization period	The "useful life years"/ amortization period used for buildings should reflect standard accounting practice in the region or country		Could be ascertained by asking individuals who operate that type of equipment how long this type of equipment usually lasts	The working life of vehicles will vary considerably, depending on vehicle type, terrain, use and maintenance. Information about the life span of the different kind of vehicles should be obtained from individuals who operate or repair that type of vehicle

Over head cost worksheet

The overhead cost worksheet, outlined in Figure 8, contains recurrent or operating costs that are not directly attributable to the individual interventions, so-called indirect or overhead costs. They include maintenance and utility costs (electricity, gas, water) for the facility, maintenance costs for vehicles and salaries for support and administrative staff such as receptionists, the clinical supervisors or the health educators responsible for maternal health IEC and social marketing activities.

Figure 8 Overhead cost worksheet: user inputs and calculations



MAIN USER INPUT

- Annual maintenance and utility cost for buildings and vehicles
- Salaries of support staff, supervisors, and IEC staff.
- Other costs associated with supervision, information, education and communication and social marketing

USED FOR CALCULATION

- Overhead cost per facility

Maintenance and utility costs

The maintenance and utility cost section of the overhead cost worksheet is shown in Screen printout 8. This section lists operating and maintenance costs for the facility as well as for the emergency vehicles. Costs included here are, among others, charges for water and electricity, and repair and maintenance done to the building and the vehicles. Some definitions of these costs are shown in Table 16. Facilities usually keep records on these costs.

Screen printout 8 Maintenance and utility costs (overhead cost worksheet)

MAINTENANCE AND UTILITY COSTS										
Personnel	Annual cost (percent of new value)	Value of facilities and equipment	Health Post		Health Centre		Hospital		MBP share	Estimated cost
			MBP share	Estimated cost	Value of facilities and equipment	MBP share	Estimated cost	Value of facilities and equipment		
Building Maintenance (2%	\$13,250	50%	\$133	\$114,950	30%	\$690	\$1,125,300	20%	\$4,501
Utilities Cost	1%	\$13,250	50%	\$66	\$114,950	30%	\$345	\$1,125,300	20%	\$2,251
Emergency Vehicle M:	10%	\$400	50%	\$20	\$20,000	30%	\$600	\$50,000	20%	\$1,000
MAINTENANCE AND UTILITY COSTS PER FACILITY				\$219			\$1,635			\$7,752

Table 16 Maintenance and utility costs

	Maintenance	Utilities	Vehicle maintenance
Cost should include	Repairs to plumbing, roofing, heating, and furniture as well as maintenance and repair of equipment. Salaries of guards and cleaning personnel should not be included here, but should be recorded under Support Staff	Annual charges for water, electricity, telephones, heating	Tyres, batteries and spare parts, insurance and registration fees. The costs of drivers should be recorded under Support Staff. The same applies to mechanics that are on the facility's payroll. If, however, repair and maintenance are done by an outside agency, the cost should be included here. Fuel consumption will be recorded under direct costs
Information source	Expenditure records kept by the facilities	Expenditure records kept by the facilities	Expenditure records kept by the facilities

Maintenance and utility costs should be obtained for the whole facility. The model will then assign the appropriate share of these costs to the *Mother-Baby Package*.

Support staff

Screen printout 9 Support staff cost (salary worksheet)

SUPPORT STAFF											
	Salary (incl. benefits) per year	Required FTE per facility	Health Post			Health Centre			Hospital		
			MBP share	Labour costs	Required FTE per facility	MBP share	Labour costs	Required FTE per facility	MBP share	Labour costs	
Guard	\$950	0	50%	\$0	1	30%	\$285	12	20%	\$2,280	
Housekeeping	\$850	0	50%	\$0	1	30%	\$255	12	20%	\$2,040	
Reception	\$950	0	50%	\$0	0	30%	\$0	1	20%	\$190	
Records	\$1,100	0	50%	\$0	0	30%	\$0	3	20%	\$660	
Supply Clerk	\$1,300	0	50%	\$0	0	30%	\$0	1	20%	\$260	
Maintenance	\$850	0	50%	\$0	1	30%	\$255	3	20%	\$510	
Mgmt Officer	\$1,500	0	50%	\$0	0	30%	\$0	1	20%	\$300	
Driver	\$900	0	50%	\$0	0	30%	\$0	2	20%	\$360	
Food Preparer	\$850	0	50%	\$0	0	30%	\$0	3	20%	\$510	
TOTAL SUPPORT SALARY COSTS PER FACILITY				\$0			\$795			\$7,110	

The support staff cost section of the overhead cost worksheet is shown in Screen printout 9. The current number of support staff should be available from the facilities. Salaries for the support staff and health investigators and educators should be available from either the Ministry of Health or from the health facilities themselves. Salaries entered here should include benefits such as health and life insurance, pension contributions, housing subsidies, etc.

Management and supervision cost

Screen printout 10 Management and supervision cost (overhead cost worksheet)

MANAGEMENT/SUPERVISION COSTS											
	Salary (incl. benefits) per year	Required FTE per facility	Health Post			Health Centre			Hospital		
			MBP share	Labour costs	Required FTE per facility	MBP share	Labour costs	Required FTE per facility	MBP share	Labour costs	
Health Inspector	\$1,200	0.05	100%	\$60	0.1	100%	\$120	0.25	100%	\$300	
Asst Health Inspector	\$1,100	0.05	100%	\$55	0.1	100%	\$110	0.25	100%	\$275	
SUB-TOTAL				\$115			\$230			\$575	
Travel Expenses (Transportation, accommodation, etc.)				\$0			\$0			\$0	
SUPERVISION COST PER FACILITY				\$115			\$230			\$575	

The management and supervision cost section of the overhead cost worksheet is shown in Screen printout 10. Apart from the salaries of the supervisors, this section should contain a rough estimate of the travel cost involved in the supervision of the district health facilities. How often will the

supervisors visit the individual facilities, how far away are the facilities, will an overnight stay be required?

IEC and social marketing cost

Screen printout 11 Information, health education and communication cost (overhead cost worksheet)

	Health Post				Health Centre				Hospital		
	Salary (incl. benefits) per year	Required FTE per facility	MBP share	Labour costs	Required FTE per facility	MBP share	Labour costs	Required FTE per facility	MBP share	Labour costs	
Health Educator	\$1,600	0.7	100%	\$160	0.2	100%	\$320	0.5	100%	\$800	
Asst Health Educator	\$1,200	0.1	100%	\$120	0.2	100%	\$240	0.5	100%	\$600	
SUB-TOTAL				\$280			\$560			\$1,400	
Audio and Visual Material				\$0			\$0			\$0	
Printed Material				\$0			\$0			\$0	
Education/Reference Material for Medical Staff				\$0			\$0			\$0	
Travel Expenses (Transportation, accommodation, etc.)				\$0			\$0			\$0	
IEC COST PER FACILITY				\$280			\$560			\$1,400	

The IEC and social marketing cost section of the overhead cost worksheet is shown on Screen printout 11. IEC and social marketing programmes promoting safe motherhood will typically be an essential part of a safe motherhood programme. They might use audio-visual materials such as videos or radio programmes or printed materials such as posters or fliers educating women about different aspects of maternal health. They might also consist of educational or reference materials that are distributed to the medical staff.

To arrive at an estimate of the cost of this programme at the *facility level*, the planner should first assign the total programme cost for the district to the three facility levels (health post, health centre and hospital level). This can be done by assigning each facility level a portion of the total costs that corresponds to the portion of total clients seen by facilities at that level. If the health posts see 60% of all clients in the districts, they are assigned 60% of the total cost of the IEC programme. The share allocated to the different levels is then divided by the number of facilities of that type in the district.

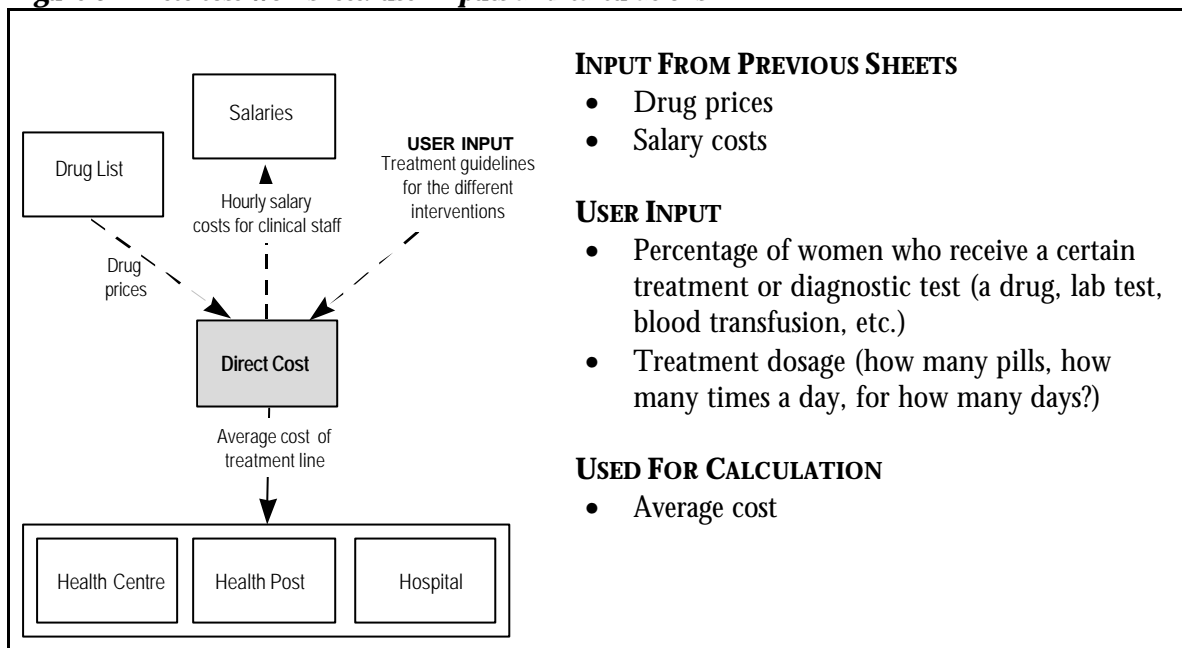
Direct cost worksheet

The direct cost worksheet, described in Figure 9 and shown in Screen printout 12, lies at the heart of the spreadsheet model. It lists all the inputs that will go directly towards providing the individual interventions to clients. This includes all the drugs and supplies, the time medical staff spends with the clients, the cost of hospitalization, laboratory tests, the cost of gas needed for the emergency transport of the client to the next facility, etc.

Screen printout 12 Direct cost worksheet (selected rows only)

DIRECT COSTS																									
Intervention	Input	Description of treatment line	Percent of intervened receiving this line at Health Post	Percent of intervened receiving this line at Health Centre	Percent of intervened receiving this line at Hospital	Age	Very severe anaemia (Hb < 4g/dl), 3rd trimester	Malaria prophylaxis/treatment	Hb>6g/dl	Folic acid tablets (if Iron given IM)	Hb>6g/dl, late stage pregnancy	Blood group and Rh factor for blood transfusion	Anaemia test	Lab Technician Time (Health Centre)	Reg Nurse/Midwife Time (Health Centre)	Lab Technician Time (Hospital)	Reg Nurse/Midwife Time (Hospital)	For blood transfusion (Hb < 4g/dl)	For taking blood	Times	Days per	Treatment	Unit cost		
																				Number per day	case/episode	units per case/episode			
Anaemia, severe	B	Blood, one unit	0%	0%	5%																2	1	1	2	\$30.00
Anaemia, severe	D	Chloroquine, tablets 150mg	0%	80%	80%																1	2	3	6	\$0.01
Anaemia, severe	D	Ferrous salt+folic acid, tablet 60mg+0.25mg	0%	70%	70%																1	3	90	270	\$0.00
Anaemia, severe	D	Folic acid, tablet 1mg	0%	30%	30%																1	1	90	90	\$0.00
Anaemia, severe	D	Iron dextran 50mg/ml, injection 5ml	0%	30%	25%																1	1	1	1	\$1.00
Anaemia, severe	L	Blood group test	0%	0%	5%																1	1	1	1	\$0.10
Anaemia, severe	L	Haemoglobin test	0%	100%	100%																1	1	2	2	\$0.10
Anaemia, severe	P	HC - Lab Technician	0%	100%	0%																0.25	1	1	0	\$2.75
Anaemia, severe	P	HC - Nurse/Midwife	0%	100%	0%																0.5	1	1	1	\$3.67
Anaemia, severe	P	Ho - Lab Technician	0%	0%	100%																0.25	1	1	0	\$2.75
Anaemia, severe	P	Ho - Nurse/Midwife	0%	0%	100%																0.5	1	1	1	\$3.67
Anaemia, severe	S	Blood giving set with needle, disposable	0%	0%	5%																1	1	1	1	\$0.34
Anaemia, severe	S	Blood lancet, disposable	0%	100%	100%																1	1	2	2	\$0.02

Figure 9 Direct cost worksheet: user inputs and calculations



The direct cost worksheet is organized alphabetically, first by intervention, as shown in Table 1 (Abortion, Anaemia, Antenatal, etc.), then by input category, as shown in Table 17, and then by treatment line.

Table 17 Cost input categories

Input category (Column B)	
B	Blood supplies
D	Drugs
H	Hospital bed + food
L	Laboratory supplies
P	Personnel cost
S	Medical supplies (disposable)
T	Emergency transport (gasoline expenses)

The worksheet in both current and standard models includes those inputs that are required to provide the interventions according to the treatment protocols of the *Mother-Baby Package*. (See Part IV: “*Mother-Baby Package Interventions*” for a detailed explanation of these treatment protocols.)

Standard treatment protocol

If the national *Mother-Baby Package* or clinical management guidelines are identical those in the *Mother-Baby Package*, then the user need not input new data. In most cases, however, modification is needed. All the drugs that are listed on the data consolidation form for the standard practice are already in the model.

Current practice

While it is technically possible to use the standard model “as is”, the current model has to be changed to reflect *current* treatment practice in the country. The spreadsheet comes with two tools that will facilitate this process. First, there is a “data collection” form, which is a form of questionnaire that can be used to gather and code data about actual treatment practice in facilities. The second tool is the data consolidation form, which is used to bring together data collected using the data collection forms, in preparation for entering the data into the spreadsheet model.

Data collection

Data collection should be performed at a representative number of facilities in the district. For a typical rural district of about 500,000 inhabitants, a sample of six to eight health posts, six to eight health centres and, and all of the hospitals in the district may well be sufficient. It is important that the data collected be representative of the situation in the district as a whole. One should therefore choose facilities that represent the different aspects of the health system in the district—urban, rural, close, remote, etc. The interview at the facility should be done with the doctor or nurse who is in charge of maternal health. Depending on the size of the facility and the scope of treatment offered the interview might take from one to two hours.

Data consolidation

In the data consolidation form, all the data that have been collected are then consolidated to arrive at a picture of the current treatment practice at each facility level. Figure 10 on page 32 illustrates the form for the intervention Antenatal Care; data consolidation forms include similar pages for all interventions in the *Mother-Baby Package*. The information on the data consolidation worksheet is organized by the different input categories as discussed above.

The form contains some information that is not in the questionnaires. The questionnaires were designed to make the interview process as easy and efficient as possible. They therefore avoid questions that are either too complicated or too obvious. For instance, anaesthesia falls in the first category. Most nurses and doctors will not be able to list all the drugs required for general anaesthesia. They are therefore only asked whether a procedure is performed under general anaesthesia. The data consolidation form then lists all the drugs required. The second category contains the obvious. Giving an injection requires a syringe, doing a blood test requires first taking blood with a blood lancet, an IV requires an IV set. These items are therefore not assessed in the questionnaire and it is the interviewer's responsibility to add them later. Again, they are already listed on the consolidation forms (immediately below the related item) and just have to be checked off.

Up to seven facilities of each level can be consolidated onto one form. Three sets of the form are needed: one for each of the different facility levels. Before the forms are printed it is possible to adapt them. The user should replace the generic "Fac. 1", "Fac. 2", etc. in the header with the names of the different facilities being surveyed.

Calculating the averages for the different facilities, one should keep in mind that the data obtained from the health personnel at the facility are dependent on the ability of providers to remember clinical practice. As such, they are not scientific, hard data, but depend completely on the recall of the person interviewed. Questions might have been misunderstood or the person interviewed might not have been that knowledgeable about a particular treatment or subject. It is therefore not recommended to take a straight average of the data presented. Obvious misunderstandings should be excluded from the calculation. Again, the main goal is to arrive at data that are *representative* for the district.

The last column on all forms shows the standard. This number cannot only be used for comparison when calculating the average for the current data. It also can and should be used to modify the current *Mother-Baby Package* standard to fit local needs and practices.

After all the data are entered and consolidated, the data should be entered into the model. This is not as work-intensive as it might seem. Only if the current treatment practice differs from the standard is it necessary to change information in the model. There are three ways in which treatments may differ. First, a certain drug might not be used. Second, another drug might be used instead. Third, a different percentage of women might receive a certain drug (only 50% of women might receive drug A instead of 100%). If the treatment is identical to the standard, no adjustments have to be made at all. The following paragraphs describe in detail how to make changes to the direct cost worksheet.

Making changes to the direct cost worksheet

If the local treatment guidelines include a drug or supply item that is not on the direct cost worksheet, it has to be added to both the drug list worksheet and the direct cost worksheet. For adding an item, see instructions below. If an item listed on the data collection form is not used in the local *Mother-Baby Package*, it should be deleted from the direct cost worksheet. For deleting an item, also see instructions below.

To add a new drug, diagnostic test, or supply to the direct cost worksheet

If the drug is not yet included on the drug list worksheet, the user should first enter it there (see instructions for entering drugs on the drug list worksheet on page 36). After switching to the direct cost worksheet, pressing the “Add New Drug to Treatment Table” will make a dialog box appear, as shown in Screen printout 13.

Screen printout 13 Adding a drug or supply to the treatment table (direct cost worksheet)

The screenshot shows a dialog box titled "Add drug to treatment table" with the following fields and options:

- Name of Drug:** Ferrous salt+folic acid, tablet 60mg+0.25mg
- Intervention:** Anaemia, severe
- % of clients receiving this line:**
 - Health Post: 0 %
 - Health: 0 %
 - Hospital: 100 %
- Type of Item:**
 - Blood
 - Drug
 - Hospital Bed
 - Laboratory Supply
 - Consumable Supply
- Dosage:** 1 units, 3 times per day for 90 days
- Remarks:** Iron Deficiency
- Buttons:** Cancel, OK

Under “Name of Drug” the user will find a drop-down box with every single drug on the drug list worksheet. From the drop-down box under “Interventions” the user will be able to select the desired intervention. After entering all the necessary information, the user only needs to press the “OK” button and the model will automatically put the information in the correct place.

Figure 10 Data consolidation form for antenatal care
ANTENATAL CARE

A. GENERAL

	Fac. 1	Fac. 2	Fac. 3	Fac. 4	Fac. 5	Fac. 6	Fac. 7	Average	Standard	Notes
Average number of ANC clients per month									–	
% receiving ANC at this facility									100%	
% of clients referred									0%	
Average number of ANC visits per client									5	

B. DRUGS AND SUPPLIES

	Number	Times per day	Number of days	% of ANC clients receiving this treatment									Average	Standard
				Fac. 1	Fac. 2	Fac. 3	Fac. 4	Fac. 5	Fac. 6	Fac. 7				
Tetanus vaccine, injection	1	1	2											
Syringe, 5 ml + needle (for tetanus injection)	1	1	2											
Ferrous salt+folic acid, tablets 60 mg+0.25 µg	1	3	90										100%	
Gloves (for physical exam)	1	1	1										100%	
Clinic-based Record	1	1	1										100%	
Home-based Maternity Record	1	1	1										100%	
Chloroquine, tables 150 mg	1	2	3										80% ⁽¹⁾	
Mebendazole, tablets 100 mg	1	2	3										30% ⁽¹⁾	
Vitamin supplements ⁽²⁾													0%	
Iodine supplement ⁽²⁾													0%	

(1) The percentages in the standard model are based on the prevalence in an average Sub-Saharan African country. They need to be adjusted to reflect local prevalence.

(2) Vitamin and iodine supplements are currently not included in the standard model. They can easily be added.

Figure 10 Data consolidation form for antenatal care (continued)

C. SUPPLIES

	Number	Times per day	Number of days	% of ANC clients receiving this treatment							Average	Standard
				Fac. 1	Fac. 2	Fac. 3	Fac. 4	Fac. 5	Fac. 6	Fac. 7		
RPR Syphilis test	1	1	1									100%
Haemoglobin test	1	1	1									100%
Blood group test	1	1	1									100%
Urinary protein test strips	1	1	1									100%
Blood lancet, disposable (to take blood sample)	1	1	1									100%
Malaria test ⁽³⁾	1	1	1									0%
Hookworm test ⁽³⁾	1	1	1									0%

(3) Depending on local policy. Currently not included in the model.

D. PERSONNEL

	Number of hours spent with client									Notes	
	Fac. 1	Fac. 2	Fac. 3	Fac. 4	Fac. 5	Fac. 6	Fac. 7	Average	Standard		
Auxiliary/Attendant										-	
Nurse/Midwife										1.75	
General Physician										-	
Obstetrician										-	
Paediatrician										-	
Anaesthetist										-	
Lab Technician										0.25	

E. COMMENTS

Changing the dosage of a drug or making other changes in the treatment table

The easiest way to make this type of change is to go directly to the respective cells on the direct cost worksheet (in the red or blue columns) and change the numbers manually.

Changing the name of a clinical staff member in the direct cost worksheet

If one wants, for instance, to globally replace the term “Auxiliary” with the term “Nursing Aide”, one should highlight Column C and then run the replace function (Edit menu, Replace all). It is important to make a corresponding change to the salary worksheet (using identical spelling).

To delete a drug or clinical staff entry from the direct cost worksheet

The user should select the entire row and delete it. After this the user needs to press the “Update all summary tables” button.

Sort order in the direct cost worksheet

The information on this worksheet has to be in alphabetical order for the model to work properly. If the special button is used to enter new drugs, the table will be resorted automatically. If drugs are inserted manually, the user has to do the resorting by pressing the “Update all summary tables” button (Screen printout 14) which will, among other things, sort the treatment list alphabetically.

Screen printout 14 Button to update summary tables (direct cost worksheet)



The health post, health centre and hospital worksheet that use the information provided on the direct cost worksheet to calculate the total cost of providing each of the interventions do this with the help of Excel “Pivot tables”. Pivot tables do not update themselves automatically when changes are made to underlying data. This means that every time a change is made to the direct cost worksheet, all the pivot tables in the model (in addition to the three tables on the HP, HC and hospital worksheet, there are also three pivot tables in the foreign exchange requirements worksheet) need to be updated. Instead of updating every single pivot table manually, the user can press the button provided at the top of the direct cost worksheet. This will automatically update and reformat all six pivot tables in the model.

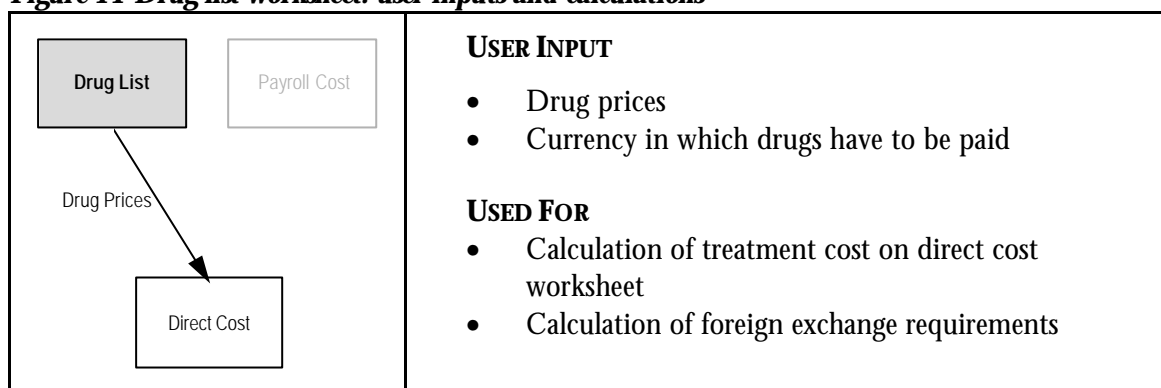
Drug list worksheet

The drug list described in Figure 11 and shown in Screen printout 15 contains all drugs and supplies that are needed for the interventions in the *Mother-Baby Package*. Besides the prices of the individual drugs, the list contains supplier and other relevant information. It also shows whether the drug is available locally or has to be purchased from an outside vendor using foreign currency. The direct cost worksheet will use the information provided in the drug list worksheet to calculate the cost of specific treatments.

Drugs currently on the list are priced according to UNICEF’s 1997 supply catalogue.¹⁰ Even though these prices are good indicative “international” prices, it is nevertheless strongly recommended to replace the international prices with local market prices or internal prices used by the national central medical stores.

¹⁰ UNICEF. *UNICEF supply catalogue*. Copenhagen, UNICEF Supply Division, 1997.

Figure 11 Drug list worksheet: user inputs and calculations



Screen printout 15 Drug list worksheet, including drugs, consumable supplies, small equipment

DRUG AND SUPPLY LIST						
Treatment line, form, strength	Supplier	Stock Number	Pack Price	Units per Pack	To be paid in US\$?	Unit Cost
Ampicillin, injection 1 g	IDA	000 4753	\$22.51	100	x	\$0.23
Ampicillin, tablets 500 mg	UNICEF	150 5048	\$6.06	100	x	\$0.06
Atropine 1mg/ml, injection 1ml	UNICEF	151 4010	\$0.78	10	x	\$0.08
Baq, urine collection, 2000 ml	UNICEF	033 0500	\$0.29	1	x	\$0.29
BCG vaccine, vial	UNICEF	000 2001	\$1.28	20	x	\$0.06
Benzathine benzylpenicillin, inj. 2.4M IU	UNICEF	155 9005	\$21.65	50	x	\$0.43
Blood giving set with needle, disposable	IDA	000 7133	\$33.92	100	x	\$0.34
Blood lancet, disposable	UNICEF	053 1995	\$4.43	250	x	\$0.02
Cannula, 18 G, disposable	UNICEF	070 9210	\$0.70	1	x	\$0.70
Cannula, 22 G, disposable	UNICEF	070 9225	\$0.69	1	x	\$0.69
Catheter, foley	UNICEF	000 3877	\$4.00	6	x	\$0.67
Chloramphenicol, injection 1 g	UNICEF	153 1030	\$2.43	5	x	\$0.49
Chlorhexidine concentrate, 5% solution	1 liter UNICEF	153 1505	\$2.72	20	x	\$0.14
Chloroquine, tablets 150 ml	UNICEF	153 2000	\$10.74	1,000	x	\$0.01
Cloxacillin, injection 500 ml	IDA	000 4774	\$19.30	100	x	\$0.19
Condoms	IDA	000 8408	\$5.50	144	x	\$0.04

In some cases, local manufacturers produce many of the drugs and supplies used for maternal care, and these are available for sale in local currency. Other drugs, however, are only available from large multinational suppliers, which require payment in convertible currency. If a drug or supply is only available for purchase with foreign currency, it should be marked in the column entitled “To be paid in US\$”. The model keeps track and summarizes costs with a local/imported cost breakdown, based on this information.

Current and standard model

The drug list worksheet will be the same for both models. The list should be updated in one model and then copied over to the other.

Adding a new drug

It is possible to add new drugs to the drug list worksheet. The drug can either be added by inserting a row and adding the drug in alphabetical order or by adding it at the end of the list and then using the button to sort the drug list alphabetically (Screen printout 16). This is important as the formula used on the direct cost worksheet to look up the drug price works only if the drug list worksheet is in alphabetical order.

Screen printout 16 Button to sort drug list (drug list worksheet)

SORT DRUG LIST IN
ALPHABETICAL
ORDER

Drugs purchased using foreign currency

If the drug has to be paid for in foreign currency, an “X” should be placed in the column “To be paid in US\$?”. No other action is necessary. The model automatically includes this item in the calculation of foreign exchange requirements for drugs and supplies.

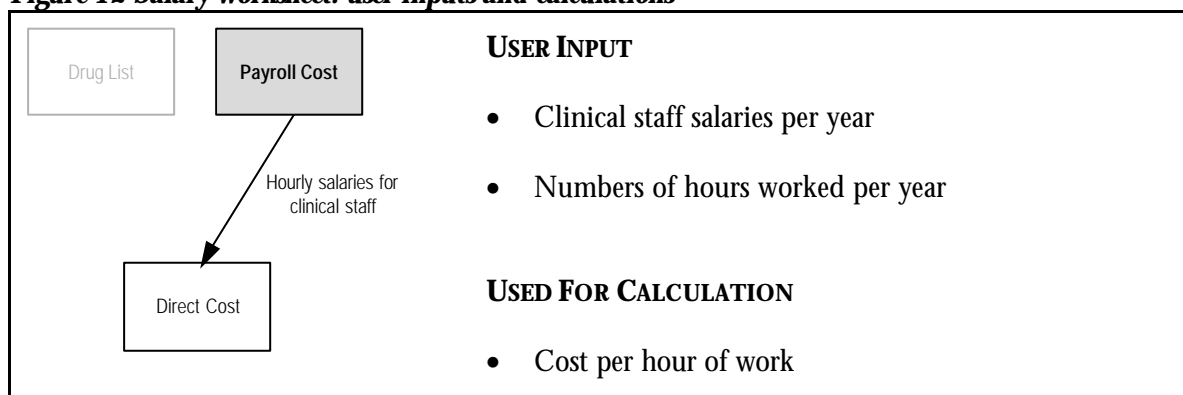
Deleting a drug that is not used

It is neither necessary nor advisable to delete drugs that are not used, since an accidental deletion of a drug that is actually used can create spreadsheet problems.¹¹ The user is therefore advised not to delete any drugs from the list.

Salary worksheet

The salary worksheet described in Figure 12 and shown in Screen printout 17 performs the same function as the drug list worksheet. It serves as a reference table for the direct cost worksheet. It contains information on the different types of clinical staff needed to provide the *Mother-Baby Package* interventions, and their costs. For each of the three levels of the health system it includes the different categories of staff and their respective salary, benefit, and training cost per year. Hourly cost information is also calculated.

Figure 12 Salary worksheet: user inputs and calculations



Salaries of clinical staff

Clinical salaries should be available from either the Ministry of Health or from the health facilities themselves. In calculating the yearly salaries one should not forget to add benefits such as health and life insurance, pension contributions, housing allowances, etc., since these often constitute a substantial part of clinical staff salary costs.

In-service training

Most staff probably already receive periodic refresher classes or other training on the job. The need for such training will probably be intensified when the government begins to implement the *Mother-Baby Package*. Staff will have to be trained or retrained in providing care according to the new standards and treatment protocols.

¹¹ The VLOOKUP function used on the direct cost worksheet to find the price of a drug will not give an error message if it cannot find a drug in the drug list. It will just pick the price of the next drug on the list. Since no error message is created, this error is difficult to detect unless the price of that drug is substantially different from the original one.

Government records might give some indication of how much is currently spent on in-service training for the different categories of medical staff. The model currently assumes in-service training costs of 10% of a staff member’s annual salary. This should be adjusted to review local training needs.

CLINICAL STAFF SALARY						
Personnel Type	Salary (incl. Benefits) per Year	In-Service Training	Salary + In-Service Training	Hours worked per Week	Weeks worked per Year	Cost per Hour Worked
HC - Anaesthetist	\$7,000	\$700	\$7,700	25	48	\$6.42
HC - Auxiliary/Attendant	\$1,500	\$150	\$1,650	25	48	\$1.38
HC - General Physician	\$7,000	\$700	\$7,700	25	48	\$6.42
HC - Lab Technician	\$3,000	\$300	\$3,300	25	48	\$2.75
HC - Nurse/Midwife	\$4,000	\$400	\$4,400	25	48	\$3.67
HC - Obstetrician	\$7,000	\$700	\$7,700	25	48	\$6.42
HC - Paediatrician	\$7,000	\$700	\$7,700	25	48	\$6.42
Ho - Anaesthetist	\$7,000	\$700	\$7,700	25	48	\$6.42
Ho - Auxiliary/Attendant	\$1,500	\$150	\$1,650	25	48	\$1.38
Ho - General Physician	\$7,000	\$700	\$7,700	25	48	\$6.42
Ho - Lab Technician	\$3,000	\$300	\$3,300	25	48	\$2.75
Ho - Nurse/Midwife	\$4,000	\$400	\$4,400	25	48	\$3.67
Ho - Obstetrician	\$7,000	\$700	\$7,700	25	48	\$6.42
Ho - Paediatrician	\$7,000	\$700	\$7,700	25	48	\$6.42
HP - Anaesthetist	\$7,000	\$700	\$7,700	25	48	\$6.42
HP - Auxiliary/Attendant	\$1,500	\$150	\$1,650	25	48	\$1.38
HP - General Physician	\$7,000	\$700	\$7,700	25	48	\$6.42
HP - Lab Technician	\$3,000	\$300	\$3,300	25	48	\$2.75
HP - Nurse/Midwife	\$4,000	\$400	\$4,400	25	48	\$3.67
HP - Obstetrician	\$7,000	\$700	\$7,700	25	48	\$6.42
HP - Paediatrician	\$7,000	\$700	\$7,700	25	48	\$6.42

Screen printout 17 Clinical salaries (salary worksheet)

Hours worked per week

It is important here not to put the number of hours medical staff is *supposed* to be working, but the number of hours staff are *actually* providing medical care and administrative tasks and record keeping directly related to the care provided.

Weeks worked per year

Working weeks in the model are calculated as 52 weeks per year, less holidays and vacation leave (currently assumed to be 4 weeks).

Staff time requirement input matrix

The salary worksheet contains several other tables. The first one, shown as Screen printout 18, is used to input staff time estimates for the different interventions. The format of the table is identical to the data consolidation form, thus facilitating data input. For each intervention and for the three levels of the health system (HP, HC, Ho) it requires how much time clinical staff spends (or, for the standard model, is supposed to spend) with the client. Currently, the average pregnant woman might have two antenatal visits lasting five minutes each. According to *Mother-Baby Package* standards, effective antenatal care should consist of at least four visits of 20 minutes each, meaning that the time a nurse or midwife spends on the average antenatal care per woman increases from 10 minutes to about 1.5 hours. This has major cost and staffing implications. Another intervention, for which time estimates might be different for the current and standard model is normal delivery care. Providing delivery care

according to WHO standards will probably require more staff time than is currently being spent on the average delivery (due to use of the partograph, stronger involvement of skilled midwives).

Screen printout 18 Staff time requirement input matrix (salary worksheet)

STAFF TIME REQUIREMENTS PER INDIVIDUAL INTERVENTION (IN HOURS)

	Abortion complications	Anaemia, severe	Antenatal Care	Eclampsia	FP - Condom	FP - Depo-provera	FP - IUD	FP - Norplant	FP - Oral Contraceptives	FP - Sterilization	Haemorrhage	Neonatal Complications	Normal Delivery Care	Obstructed Labour	Postpartum Care	Sepsis	STD - Other	STD - Syphilis
HEALTH POST																		
HP - Auxiliary/Attendant	--	--	1.50	--	0.50	--	--	--	1.00	--	--	--	--	--	0.25	--	0.50	0.75
HP - Nurse/Midwife	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HP - General Physician	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HP - Obstetrician	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HP - Paediatrician	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HP - Anaesthetist	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HP - Lab Technician	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEALTH CENTRE																		
HC - Auxiliary/Attendant	0.50	--	--	--	--	--	--	--	--	--	1.00	--	2.00	--	--	1.00	--	--
HC - Nurse/Midwife	0.50	0.50	1.75	--	0.50	1.00	1.00	1.00	1.00	--	2.00	--	4.00	--	0.25	1.00	0.50	0.75
HC - General Physician	0.50	--	--	--	--	--	--	--	--	--	1.00	--	--	--	--	--	--	--
HC - Obstetrician	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC - Paediatrician	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC - Anaesthetist	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC - Lab Technician	0.25	0.25	0.25	--	--	--	--	--	--	--	0.25	--	--	--	--	0.25	--	0.25
HOSPITAL																		
Ho - Auxiliary/Attendant	2.00	--	--	12.00	--	--	--	--	--	0.50	4.50	7.00	2.00	4.50	--	2.00	--	--
Ho - Nurse/Midwife	1.00	0.50	1.75	24.00	0.50	1.00	1.00	1.00	1.00	1.00	2.00	2.00	4.00	2.00	0.25	1.00	0.50	0.75
Ho - General Physician	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ho - Obstetrician	1.00	--	0.25	2.00	--	--	--	--	--	0.50	1.00	--	--	1.00	--	--	--	--
Ho - Paediatrician	--	--	--	--	--	--	--	--	--	--	--	1.00	--	--	--	--	--	--
Ho - Anaesthetist	1.00	--	--	--	--	--	--	--	--	--	1.00	--	--	1.00	--	--	--	--
Ho - Lab Technician	0.25	0.25	0.25	0.25	--	--	--	--	--	--	0.25	--	--	--	--	0.25	--	0.25

The other two tables on the worksheet use the information from the time table and by multiplying it with the predicted number of cases per intervention calculate how many of each type of staff will be needed to provide the interventions (Screen printout 19). While these estimates are necessarily rough, they can give a general impression of the accuracy of the estimates made above. For technical details and formulae used see Appendix B.

Screen printout 19 Staff requirements, by facility type

<i>Requirements in Hours</i>	Total Hours	Hours worked per Year	Total Number of Staff Required	Number of Staff per Facility
HEALTH POST				
HP - Auxiliary/Attendant	15 959	1 200	13.3	0.3
HP - Nurse/Midwife	--	1 200	--	--
HP - General Physician	--	1 200	--	--
HP - Obstetrician	--	1 200	--	--
HP - Paediatrician	--	1 200	--	--
HP - Anaesthetist	--	1 200	--	--
HP - Lab Technician	--	1 200	--	--
HEALTH CENTRE				
HC - Auxiliary/Attendant	14 817	1 200	12.3	0.6
HC - Nurse/Midwife	43 111	1 200	35.9	1.8
HC - General Physician	163	1 200	0.1	0.0
HC - Obstetrician	--	1 200	--	--
HC - Paediatrician	163	1 200	0.1	0.0
HC - Anaesthetist	--	1 200	--	--
HC - Lab Technician	1 686	1 200	1.4	0.1
HOSPITAL				
Ho - Auxiliary/Attendant	21 316	1 200	17.8	8.9
Ho - Nurse/Midwife	19 229	1 200	16.0	8.0
Ho - General Physician	--	1 200	--	--
Ho - Obstetrician	2 680	1 200	2.2	1.1
Ho - Paediatrician	1 700	1 200	1.4	0.7
Ho - Anaesthesist	1 402	1 200	1.2	0.6
Ho - Lab Technician	1 063	1 200	0.9	0.4

Health post, health centre and hospital worksheets

These three worksheets, described in Figure 13 and printed out in Screen printout 20 calculate the cost of providing maternal and newborn interventions at the health post, health centre, and hospital level (for illustrative purposes Screen printout 20 includes the health post only). No user input is required; the model pulls all the necessary information from other worksheets.

The worksheets are organized according to three cost categories: direct cost, overhead cost, and capital cost. Direct costs are first shown per patient, then for all patients treated at that level; overhead and capital costs are first shown per facility and then for all facilities on that level. Finally, all costs are summed up to give the total cost incurred at that level.

Screen printout 20 Health post worksheet

1. DIRECT COST

DIRECT COST - PER CLIENT

Intervention	Blood Products	Drugs	Hospital Bed + Food	Lab Supplies	Personnel	Consumable Supplies	Transportation	Grand Total
Abortion Complications	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Anaemia, severe	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Antenatal Care	\$0.00	\$0.87	\$0.00	\$0.03	\$9.63	\$2.09	\$0.00	\$12.62
Eclampsia	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
FP - Condom	\$0.00	\$0.00	\$0.00	\$0.00	\$3.21	\$3.82	\$0.00	\$7.03
FP - Depoprovera	\$0.00	\$3.40	\$0.00	\$0.00	\$6.42	\$0.33	\$0.00	\$10.15
FP - IUD	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
FP - Norplant	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
FP - Oral Contraceptives	\$0.00	\$4.74	\$0.00	\$0.00	\$6.42	\$0.00	\$0.00	\$11.15
FP - Sterilization	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Haemorrhage	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Neonatal Complications	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Normal Delivery	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Obstructed Labour	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Postpartum Care	\$0.00	\$0.10	\$0.00	\$0.00	\$1.60	\$0.00	\$0.00	\$1.71
Sepsis	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
STD - Other	\$0.00	\$1.45	\$0.00	\$0.00	\$3.21	\$0.01	\$0.00	\$4.67
STD - Syphilis	\$0.00	\$2.15	\$0.00	\$0.00	\$4.81	\$0.13	\$0.00	\$7.09

DIRECT COST - TOTAL

	Blood Products	Drugs	Hospital Bed + Food	Lab Supplies	Personnel	Consumable Supplies	Transportation	Grand Total
Abortion Complications	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Anaemia, severe	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Antenatal Care	\$0	\$7,357	\$0	\$279	\$80,994	\$17,604	\$0	\$106,235
Eclampsia	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FP - Condom	\$0	\$0	\$0	\$0	\$902	\$1,073	\$0	\$1,975
FP - Depoprovera	\$0	\$3,815	\$0	\$0	\$7,200	\$376	\$0	\$11,390
FP - IUD	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FP - Norplant	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FP - Oral Contraceptives	\$0	\$3,187	\$0	\$0	\$4,318	\$0	\$0	\$7,505
FP - Sterilization	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Haemorrhage	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Neonatal Complications	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Normal Delivery Care	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Obstructed Labour	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Postpartum Care	\$0	\$789	\$0	\$0	\$12,272	\$0	\$0	\$13,061
Sepsis	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
STD - Other	\$0	\$1,221	\$0	\$0	\$2,701	\$8	\$0	\$3,930
STD - Syphilis	\$0	\$542	\$0	\$0	\$1,213	\$33	\$0	\$1,788
TOTAL	\$0	\$16,911	\$0	\$279	\$109,600	\$19,093	\$0	\$145,884

2. OVERHEAD COST

OVERHEAD COST - PER FACILITY

Maintenance and Utility	\$219
Support Salaries	\$0
Supervision	\$115
IEC and Social Marketing	\$280
TOTAL	\$614

Number
of Facilities

50

Maintenance and Utility	\$10,938
Support Salaries	\$0
Supervision	\$5,750
IEC and Social Marketing	\$14,000
TOTAL	\$30,688

3. CAPITAL COST

CAPITAL COST - PER FACILITY

Facilities	\$250
Furniture and Beds	\$71
Refrigerators	\$89
Exam. & Surgery Equipment	\$100
Communications Equipment	\$125
Vehicles	\$29
Other	\$0
TOTAL	\$664

Number
of Facilities

50

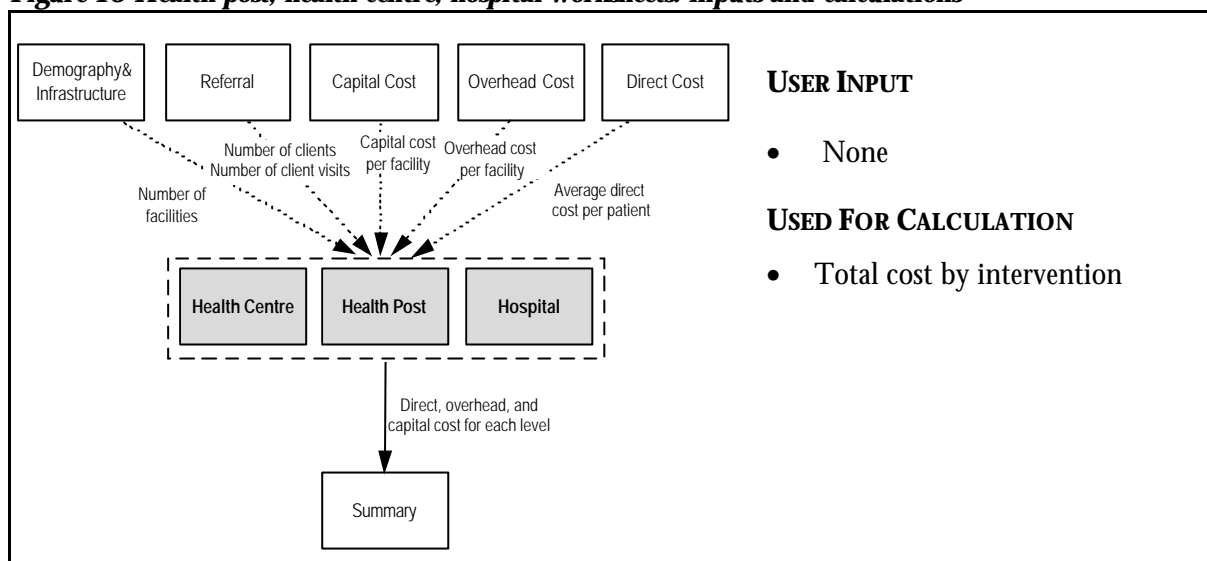
CAPITAL COST - TOTAL

Facilities	\$12,500
Furniture and Beds	\$3,571
Refrigerators	\$4,464
Exam. & Surgery Equipment	\$5,000
Communications Equipment	\$6,250
Vehicles	\$1,429
Other	\$0
TOTAL	\$33,214

4. TOTAL COST

	Number of Client Visits	Percent of Total Client Visits	Total Direct Cost	Overhead Cost*	Total Recurrent Cost	Capital Cost*	Total Cost
Abortion Complications	0	0.0%	\$0	\$0	\$0	\$0	\$0
Anaemia, severe	0	0.0%	\$0	\$0	\$0	\$0	\$0
Antenatal Care	33,660	67.3%	\$106,235	\$20,656	\$126,891	\$22,357	\$149,248
Eclampsia	0	0.0%	\$0	\$0	\$0	\$0	\$0
FP - Condom	1,124	2.2%	\$1,975	\$690	\$2,665	\$747	\$3,411
FP - Depoprovera	0	0.0%	\$11,390	\$0	\$11,390	\$0	\$11,390
FP - IUD	0	0.0%	\$0	\$0	\$0	\$0	\$0
FP - Norplant	0	0.0%	\$0	\$0	\$0	\$0	\$0
FP - Oral Contraceptives	2,692	5.4%	\$7,505	\$1,652	\$9,157	\$1,788	\$10,945
FP - Sterilization	0	0.0%	\$0	\$0	\$0	\$0	\$0
Haemorrhage	0	0.0%	\$0	\$0	\$0	\$0	\$0
Neonatal Complications	0	0.0%	\$0	\$0	\$0	\$0	\$0
Normal Delivery Care	0	0.0%	\$0	\$0	\$0	\$0	\$0
Obstructed Labour	0	0.0%	\$0	\$0	\$0	\$0	\$0
Postpartum Care	7,650	15.3%	\$13,061	\$4,695	\$17,756	\$5,081	\$22,837
Sepsis	0	0.0%	\$0	\$0	\$0	\$0	\$0
STD - Other	3,368	6.7%	\$3,930	\$2,067	\$5,997	\$2,237	\$8,234
STD - Syphilis	1,512	3.0%	\$1,788	\$928	\$2,716	\$1,004	\$3,720
TOTAL	50,006	100.0%	\$145,884	\$30,688	\$176,571	\$33,214	\$209,786

Figure 13 Health post, health centre, hospital worksheets inputs and calculations



Direct cost section of health post, health centre, hospital worksheets

Direct cost—per client

The direct cost sections of health post, health centre, hospital worksheets first show the direct cost per client of providing the interventions by type of input (blood supplies, drugs, personnel cost, etc.). This is shown in Screen printout 21.

Screen printout 21 Direct cost summary per client (health post worksheet)

1. DIRECT COST

DIRECT COST - PER CLIENT								
Intervention	Blood Products	Drugs	Hospital Bed + Food	Lab Supplies	Personnel	Consumable Supplies	Transportation	Grand Total
Abortion Complications	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Anaemia, severe	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Antenatal Care	\$0.00	\$0.87	\$0.00	\$0.03	\$9.63	\$2.09	\$0.00	\$12.62
Eclampsia	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
FP - Condom	\$0.00	\$0.00	\$0.00	\$0.00	\$3.21	\$3.82	\$0.00	\$7.03
FP - Depoprovera	\$0.00	\$3.40	\$0.00	\$0.00	\$6.42	\$0.33	\$0.00	\$10.15
FP - IUD	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
FP - Norplant	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
FP - Oral Contraceptives	\$0.00	\$4.74	\$0.00	\$0.00	\$6.42	\$0.00	\$0.00	\$11.15
FP - Sterilization	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Haemorrhage	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Neonatal Complications	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Normal Delivery	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Obstructed Labour	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Postpartum Care	\$0.00	\$0.10	\$0.00	\$0.00	\$1.60	\$0.00	\$0.00	\$1.71
Sepsis	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
STD - Other	\$0.00	\$1.45	\$0.00	\$0.00	\$3.21	\$0.01	\$0.00	\$4.67
STD - Syphilis	\$0.00	\$2.15	\$0.00	\$0.00	\$4.81	\$0.13	\$0.00	\$7.09

Direct cost—total

The direct cost sections of health post, health centre, hospital worksheets then show the total direct cost of providing the interventions by type of input (blood supplies, drugs, personnel cost, etc.). This is shown in Screen printout 22. In this case the cost per patient has been multiplied by the number of patients to arrive at the total direct cost for the intervention.

Screen printout 22 Direct cost summary totals (health post worksheet)

DIRECT COST - TOTAL

	Blood Products	Drugs	Hospital Bed + Food	Lab Supplies	Personnel	Consumable Supplies	Transportation	Grand Total
Abortion Complications	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Anaemia, severe	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Antenatal Care	\$0	\$7,357	\$0	\$279	\$80,994	\$17,604	\$0	\$106,235
Eclampsia	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FP - Condom	\$0	\$0	\$0	\$0	\$902	\$1,073	\$0	\$1,975
FP - Depoprovera	\$0	\$3,815	\$0	\$0	\$7,200	\$376	\$0	\$11,390
FP - IUD	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FP - Norplant	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FP - Oral Contraceptives	\$0	\$3,187	\$0	\$0	\$4,318	\$0	\$0	\$7,505
FP - Sterilization	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Haemorrhage	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Neonatal Complications	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Normal Delivery Care	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Obstructed Labour	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Postpartum Care	\$0	\$789	\$0	\$0	\$12,272	\$0	\$0	\$13,061
Sepsis	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
STD - Other	\$0	\$1,221	\$0	\$0	\$2,701	\$8	\$0	\$3,930
STD - Syphilis	\$0	\$542	\$0	\$0	\$1,213	\$33	\$0	\$1,788
TOTAL	\$0	\$16,911	\$0	\$279	\$109,600	\$19,093	\$0	\$145,884

Over head cost

The overhead cost per facility, shown in Screen printout 23, is pulled directly from the overhead cost worksheet. The costs are then multiplied by the number of facilities (in the demography worksheet) to arrive at total overhead costs.

Screen printout 23 Overhead cost totals (health post worksheet)

2. OVERHEAD COST

OVERHEAD COST - PER FACILITY

Maintenance and Utility	\$219
Support Salaries	\$0
Supervision	\$115
IEC and Social Marketing	\$280
TOTAL	\$614

Number
of Facilities
50

OVERHEAD COST - TOTAL

Maintenance and Utility	\$10 938
Support Salaries	\$0
Supervision	\$5 750
IEC and Social Marketing	\$14 000
TOTAL	\$30 688

Capital cost

Like overhead costs, capital costs are shown first per facility and then for all health posts, health centres or hospitals in the district. This is shown in Screen printout 24.

Screen printout 24 Capital cost totals (health post worksheet)

3. CAPITAL COST

CAPITAL COST - PER FACILITY

Facilities	\$250
Furniture and Beds	\$71
Refrigerators	\$89
Exam. & Surgery Equipment	\$100
Communications Equipment	\$125
Vehicles	\$29
Other	\$0
TOTAL	\$664

Number
of Facilities
50

CAPITAL COST - TOTAL

Facilities	\$12,500
Furniture and Beds	\$3,571
Refrigerators	\$4,464
Exam. & Surgery Equipment	\$5,000
Communications Equipment	\$6,250
Vehicles	\$1,429
Other	\$0
TOTAL	\$33,214

Total cost

The total costs section sums up the results of the previous sections. Since it is not possible to attribute overhead and capital costs directly to any one intervention, they are allocated across all the interventions according to number of client contacts. Interventions that use a lot of these resources

are allocated more; interventions that use fewer of these resources are allocated lower costs. As a proxy of utilization, the model uses the relative number of visits. Antenatal care visits, for instance, might make up 80% of the total visits at a health post; the intervention “Antenatal Care” therefore will be allocated 80% of the overhead cost. For some interventions there might be only a handful of cases; they will therefore have to bear only a small share of total overhead costs. The resulting total cost is shown in Screen printout 25.

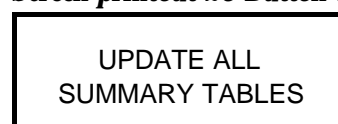
4. TOTAL COST

	Number of Client Visits	Percent of Total Client Visits	Total Direct Cost	Overhead Cost*	Total Recurrent Cost	Capital Cost*	Total Cost
Abortion Complications	0	0.0%	\$0	\$0	\$0	\$0	\$0
Anaemia, severe	0	0.0%	\$0	\$0	\$0	\$0	\$0
Antenatal Care	33,660	67.3%	\$106,235	\$20,656	\$126,891	\$22,357	\$149,248
Eclampsia	0	0.0%	\$0	\$0	\$0	\$0	\$0
FP - Condom	1,124	2.2%	\$1,975	\$690	\$2,665	\$747	\$3,411
FP - Depoprovera	0	0.0%	\$11,390	\$0	\$11,390	\$0	\$11,390
FP - IUD	0	0.0%	\$0	\$0	\$0	\$0	\$0
FP - Norplant	0	0.0%	\$0	\$0	\$0	\$0	\$0
FP - Oral Contraceptives	2,692	5.4%	\$7,505	\$1,652	\$9,157	\$1,788	\$10,945
FP - Sterilization	0	0.0%	\$0	\$0	\$0	\$0	\$0
Haemorrhage	0	0.0%	\$0	\$0	\$0	\$0	\$0
Neonatal Complications	0	0.0%	\$0	\$0	\$0	\$0	\$0
Normal Delivery Care	0	0.0%	\$0	\$0	\$0	\$0	\$0
Obstructed Labour	0	0.0%	\$0	\$0	\$0	\$0	\$0
Postpartum Care	7,650	15.3%	\$13,061	\$4,695	\$17,756	\$5,081	\$22,837
Sepsis	0	0.0%	\$0	\$0	\$0	\$0	\$0
STD - Other	3,368	6.7%	\$3,930	\$2,067	\$5,997	\$2,237	\$8,234
STD - Syphilis	1,512	3.0%	\$1,788	\$928	\$2,716	\$1,004	\$3,720
TOTAL	50,006	100.0%	\$145,884	\$30,688	\$176,571	\$33,214	\$209,786

Screen printout 25 Total cost estimates (health post worksheet)

Updating tables on health post, health centre and hospital worksheets

Screen printout 26 Button to update summary tables



The health post, health centre and hospital worksheets calculate the direct cost per client using Excel “Pivot tables”. Pivot tables do not update themselves automatically when changes are made to underlying data. This means that every time a change is made to the direct cost worksheet, these pivot tables need to be updated. In order to update all pivot tables in the model, the user can press the button entitled “Update all summary tables” found at the top of the direct cost worksheet (Screen printout 26 above). This will automatically update and reformat all of the pivot tables in the model.

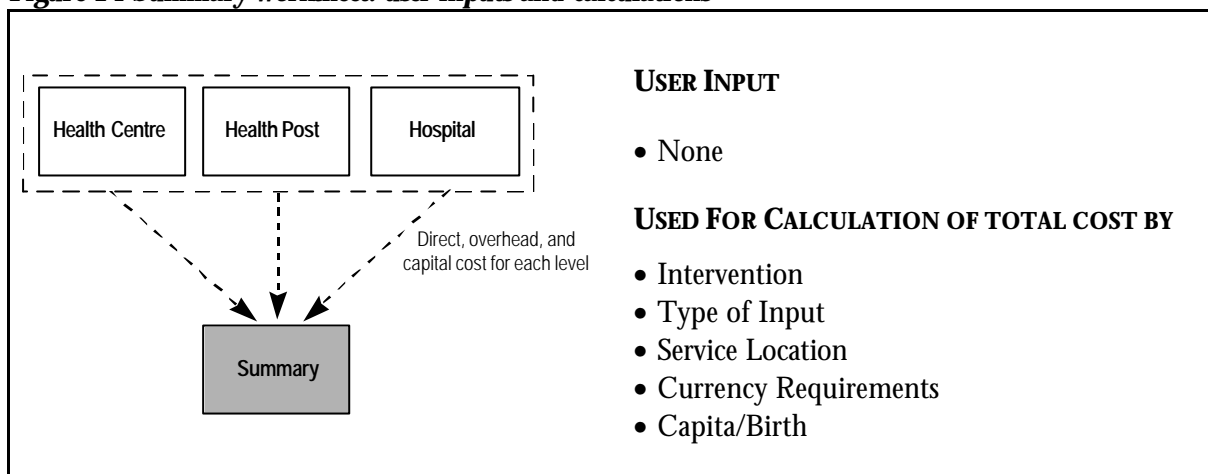
Summary worksheet

The summary worksheet described in Figure 14 gathers data from the previous three worksheets, and allows for comparison between them. The user need not input any new data. All data are linked to previous worksheets or derive from calculations performed on the linked data.

The summary worksheet is divided into three main sections, offering three different options for summarizing the cost: (a) direct cost only, (b) recurrent cost (direct and overhead) and (c) total cost (recurrent and capital cost). Each of these three sections follows the same basic structure. While the

information shown in Screen printout 27 below covers total costs only, the direct and recurrent cost summary tables follow the same structure.

Figure 14 Summary worksheet: user inputs and calculations



The following shows the direct cost page, which is page 1 of 3 on the summary worksheet.

Screen printout 27 Summary worksheet

TOTAL DIRECT COST															
1. BY INTERVENTION															
	NUMBER OF CLIENTS				DIRECT COST PER CLIENT			TOTAL DIRECT COST				PERCENT OF TOTAL COST			
	Health Post	Health Centre	Hospital	Total	Health Post	Health Centre	Hospital	Health Post	Health Centre	Hospital	Total	Health Post	Health Centre	Hospital	Total
Abortion complications	0	252	589	841	\$0.00	\$20.62	\$39.64	\$0	\$5,196	\$23,350	\$28,546	0.0%	2.1%	9.3%	5.2%
Anaemia, severe	0	183	154	337	\$0.00	\$3.37	\$6.34	\$0	\$616	\$976	\$1,592	0.0%	0.2%	0.4%	0.3%
Antenatal Care	8,415	5,891	2,525	16,831	\$5.06	\$10.42	\$12.03	\$42,596	\$61,392	\$30,364	\$134,353	79.8%	24.7%	12.0%	24.3%
Eclampsia	0	0	43	43	\$0.00	\$0.00	\$161.83	\$0	\$0	\$6,959	\$6,959	0.0%	0.0%	2.8%	1.3%
FP - Condom	281	196	84	561	\$4.51	\$5.65	\$5.65	\$1,266	\$1,108	\$475	\$2,849	2.4%	0.4%	0.2%	0.5%
FP - Depo-provera	0	1,907	337	2,244	\$5.11	\$7.40	\$7.40	\$0	\$14,115	\$2,494	\$16,609	0.0%	5.7%	1.0%	3.0%
FP - IUD	0	238	42	280	\$0.00	\$4.80	\$4.80	\$0	\$1,142	\$202	\$1,343	0.0%	0.5%	0.1%	0.2%
FP - Norplant	0	48	8	56	\$0.00	\$27.22	\$27.22	\$0	\$1,306	\$218	\$1,524	0.0%	0.5%	0.1%	0.3%
FP - Oral Contraceptives	673	471	202	1,346	\$5.09	\$7.38	\$7.38	\$3,426	\$3,477	\$1,491	\$8,394	6.4%	1.4%	0.6%	1.5%
FP - Sterilization	0	0	1,122	1,122	\$0.00	\$0.00	\$11.57	\$0	\$0	\$12,977	\$12,977	0.0%	0.0%	5.1%	2.3%
Haemorrhage	0	50	375	425	\$0.00	\$32.84	\$55.88	\$0	\$1,642	\$20,956	\$22,598	0.0%	0.7%	8.3%	4.1%
Neonatal Complications	0	0	1,700	1,700	\$0.00	\$0.00	\$45.37	\$0	\$0	\$77,125	\$77,125	0.0%	0.0%	30.6%	13.9%
Normal Delivery Care	0	7,225	1,275	8,500	\$0.00	\$20.07	\$20.82	\$0	\$145,001	\$26,545	\$171,546	0.0%	58.3%	10.5%	31.0%
Obstructed Labour	0	0	425	425	\$0.00	\$0.00	\$63.97	\$0	\$0	\$27,186	\$27,186	0.0%	0.0%	10.8%	4.9%
Postpartum Care	7,650	5,355	2,295	15,300	\$0.45	\$1.02	\$1.02	\$3,419	\$5,461	\$2,340	\$11,220	6.4%	2.2%	0.9%	2.0%
Sepsis	0	204	476	680	\$0.00	\$25.64	\$36.16	\$0	\$5,230	\$17,211	\$22,441	0.0%	2.1%	6.8%	4.1%
STD - Other	842	589	252	1,683	\$2.15	\$3.29	\$3.29	\$1,808	\$1,939	\$830	\$4,577	3.4%	0.8%	0.3%	0.8%
STD - Syphilis	252	177	76	505	\$3.31	\$5.03	\$5.03	\$835	\$891	\$382	\$2,108	1.6%	0.4%	0.2%	0.4%
TOTAL	18,113	22,786	11,980	52,879	\$25.68	\$174.75	\$515.39	\$53,350	\$248,516	\$252,081	\$553,946	100.0%	100.0%	100.0%	100.0%

2. BY INPUT					3. BY SERVICE LOCATION					
	TOTAL DIRECT COST				PERCENT OF TOTAL COST				Total Cost	% of Total Cost
	Health Post	Health Centre	Hospital	Total	Health Post	Health Centre	Hospital	Total		
Blood Products	\$0	\$0	\$5,754	\$5,754	0.0%	0.0%	2.3%	1.0%	\$53,350	9.6%
Drugs	\$12,410	\$23,311	\$36,306	\$72,026	23.3%	9.4%	14.4%	13.0%	\$248,516	44.9%
Hospital Bed + Food	\$0	\$4,119	\$65,395	\$69,514	0.0%	1.7%	25.3%	12.5%	\$252,081	45.5%
Lab Supplies	\$279	\$2,119	\$1,312	\$3,711	0.5%	0.9%	0.5%	0.7%		
Personnel	\$21,943	\$188,654	\$100,625	\$311,222	41.1%	75.9%	39.9%	56.2%		
Consumable Supplies	\$18,718	\$29,479	\$38,369	\$86,566	35.1%	11.9%	15.2%	15.6%		
Transportation	\$0	\$834	\$4,320	\$5,154	0.0%	0.3%	1.7%	0.9%		
TOTAL	\$53,350	\$248,516	\$252,081	\$553,946	100.0%	100.0%	100.0%	100.0%		

4. BY CURRENCY		5. PER CAPITA	
	% of Total Cost		Direct Cost
Local Currency	\$386,489	Per client	\$10.48
Foreign Currency	\$167,458	Per capita	\$1.11
TOTAL	\$553,946	Per birth	\$32.59

Summary by intervention

The first section, shown in Screen printout 28, organizes the information by intervention. The user can compare the number of clients and the average cost of treatment at the different levels, as well as comparing the total cost incurred in the provision of the different interventions at health post, health

centre, and hospital. Finally, the user can see what portion of the entire cost of the *Mother-Baby Package* interventions the individual interventions represent.

1. BY INTERVENTION

	NUMBER OF CLIENTS				TOTAL COST				PERCENT OF TOTAL COST			
	Health Post	Health Centre	Hospital	Total	Health Post	Health Centre	Hospital	Total	Health Post	Health Centre	Hospital	Total
Abortion complications	0	252	589	841	\$0	\$6 298	\$26 593	\$32 892	0.0%	1.7%	8.2%	3.6%
Anaemia, severe	0	183	154	337	\$0	\$1 468	\$1 655	\$3 124	0.0%	0.4%	0.5%	0.3%
Antenatal Care	8 415	5 891	2 525	16 831	\$149 248	\$125 827	\$51 219	\$326 294	71.1%	33.7%	15.8%	35.9%
Eclampsia	0	0	43	43	\$0	\$0	\$7 373	\$7 373	0.0%	0.0%	2.3%	0.8%
FP - Condom	281	196	84	561	\$3 411	\$2 823	\$937	\$7 172	1.6%	0.8%	0.3%	0.8%
FP - Depoprovera	1 122	785	337	2 244	\$11 390	\$12 679	\$4 350	\$28 419	5.4%	3.4%	1.3%	3.1%
FP - IUD	0	238	42	280	\$0	\$2 704	\$375	\$3 079	0.0%	0.7%	0.1%	0.3%
FP - Norplant	0	48	8	56	\$0	\$1 621	\$251	\$1 872	0.0%	0.4%	0.1%	0.2%
FP - Oral Contraceptives	673	471	202	1 346	\$10 945	\$8 079	\$2 809	\$21 833	5.2%	2.2%	0.9%	2.4%
FP - Sterilization	0	0	1 122	1 122	\$0	\$0	\$17 610	\$17 610	0.0%	0.0%	5.4%	1.9%
Haemorrhage	0	37	388	425	\$0	\$1 377	\$25 422	\$26 798	0.0%	0.4%	7.8%	3.0%
Neonatal Complications	0	0	1 700	1 700	\$0	\$0	\$93 506	\$93 506	0.0%	0.0%	28.8%	10.3%
Normal Delivery Care	0	7 225	1 275	8 500	\$0	\$176 611	\$30 055	\$206 666	0.0%	47.3%	9.2%	22.8%
Obstructed Labour	0	0	425	425	\$0	\$0	\$32 235	\$32 235	0.0%	0.0%	9.9%	3.5%
Postpartum Care	7 650	5 355	2 295	15 300	\$22 837	\$17 176	\$5 500	\$45 512	10.9%	4.6%	1.7%	5.0%
Sepsis	0	204	476	680	\$0	\$6 235	\$21 990	\$28 225	0.0%	1.7%	6.8%	3.1%
STD - Other	842	589	252	1 683	\$8 234	\$7 093	\$2 217	\$17 545	3.9%	1.9%	0.7%	1.9%
STD - Syphilis	252	177	76	505	\$3 720	\$3 214	\$1 010	\$7 944	1.8%	0.9%	0.3%	0.9%
TOTAL	19 235	21 651	11 993	52 879	\$209 786	\$373 205	\$325 108	\$908 099	100.0%	100.0%	100.0%	100.0%

Screen printout 28 Total cost by intervention (summary worksheet)

Summary by input

The second section, shown in Screen printout 29, presents the total costs across all interventions by the type of input, i.e. drug costs, salary expenses, maintenance costs, etc. It permits quick comparison of how much will be spent on the different inputs for the *Mother-Baby Package* at each facility level, regardless of the specific interventions.

Screen printout 29 Total cost by input (summary worksheet)

2. BY INPUT

	TOTAL COST				PERCENT OF TOTAL COST			
	Health Post	Health Centre	Hospital	Total	Health Post	Health Centre	Hospital	Total
Blood Products	\$0	\$0	\$5,832	\$5,832	0.0%	0.0%	1.8%	0.6%
Drugs	\$16,911	\$19,910	\$37,422	\$74,243	8.1%	5.3%	11.5%	8.2%
Hospital Bed + Food	\$0	\$4,106	\$65,509	\$69,614	0.0%	1.1%	20.1%	7.7%
Lab Supplies	\$279	\$2,168	\$1,434	\$3,881	0.1%	0.6%	0.4%	0.4%
Personnel	\$109,600	\$184,334	\$100,910	\$394,844	52.2%	49.4%	31.0%	43.5%
Consumable Supplies	\$19,093	\$29,116	\$38,738	\$86,948	9.1%	7.8%	11.9%	9.6%
Transportation	\$0	\$795	\$4,359	\$5,154	0.0%	0.2%	1.3%	0.6%
Maintenance and Utility	\$10,938	\$32,691	\$15,504	\$59,132	5.2%	8.8%	4.8%	6.5%
Support Salaries	\$0	\$15,900	\$14,220	\$30,120	0.0%	4.3%	4.4%	3.3%
Supervision	\$5,750	\$4,600	\$1,150	\$11,500	2.7%	1.2%	0.4%	1.3%
IEC and Social Marketing	\$14,000	\$11,200	\$2,800	\$28,000	6.7%	3.0%	0.9%	3.1%
Facilities	\$12,500	\$30,000	\$20,000	\$62,500	6.0%	8.0%	6.2%	6.9%
Furniture and Beds	\$3,571	\$8,571	\$5,714	\$17,857	1.7%	2.3%	1.8%	2.0%
Refrigerators	\$4,464	\$1,671	\$160	\$6,296	2.1%	0.4%	0.0%	0.7%
Exam. & Surgery Equipment	\$5,000	\$8,000	\$8,000	\$21,000	2.4%	2.1%	2.5%	2.3%
Communications Equipment	\$6,250	\$3,000	\$500	\$9,750	3.0%	0.8%	0.2%	1.1%
Vehicles	\$1,429	\$17,143	\$2,857	\$21,429	0.7%	4.6%	0.9%	2.4%
Other	\$0	\$0	\$0	\$0	0.0%	0.0%	0.0%	0.0%
TOTAL	\$209,786	\$373,205	\$325,108	\$908,099	100.0%	100.0%	100.0%	100.0%

Summary by service location and currency requirements and per capita and per birth costs

The third section, shown in Screen printout 30, shows total cost and share of total cost by facility level. Section 4 shows what percentage of the total cost has to be paid in foreign currency. The fifth section, finally, shows costs per capita and per birth of the *Mother-Baby Package*.

Screen printout 30 Grand total, per capita, per client costs (summary worksheet)

3. BY SERVICE LOCATION

	Total Cost	% of Total Cost
Health Post	\$209,786	23.1%
Health Centre	\$373,205	41.1%
Hospital	\$325,108	35.8%
TOTAL	\$908,099	100.0%

5. AVERAGE COST

	Total Cost
Per capita	\$1.82
Per birth*	\$106.84
Per pregnant woman*	\$53.96

Screen printout 31 Cost per life saved worksheet

MATERNAL AND NEONATAL DEATHS

Population	500,000
CBR	34.0
Live births	17,000
MMR (per 100,000 live births)	600
Annual maternal deaths	102
Neonatal mortality rate (per 1,000 live births)	48
Annual neonatal deaths	816

MATERNAL DEATHS AVERTED

Causes	% of Maternal Deaths	Number of Maternal Deaths	Potential Impact	
			in Deaths Averted	Potential Lives Saved
Haemorrhage	25%	26	55%	14
Sepsis	15%	15	75%	11
Hypertensive disorders/eclan	12%	12	65%	8
Obstructed labour	8%	8	80%	7
Unsafe abortion	13%	13	75%	10
Other direct causes	7%	7	-	-
Indirect causes	20%	20	20%	4
Total	100%	102	-	54

Source: Mother-Baby Package: Implementing safe motherhood in countries, p. 2, 18

NEWBORN DEATHS AVERTED

Causes	% of Newborn Deaths	Number of Newborn Deaths	Potential Impact	
			in Deaths Averted	Potential Lives Saved
Birth asphyxia	21.1%	172	50%	86
Birth injuries	10.6%	86	50%	43
Neonatal tetanus	14.1%	115	80%	92
Sepsis and meningitis	7.2%	59	40%	24
Pneumonia	19.0%	155	50%	78
Diarrhoea	1.5%	12	50%	6
Prematurity	10.3%	84	-	-
Congenital anomalies	11.1%	91	-	-
Other	5.1%	42	-	-
Total	100.0%	816	-	329

Source: Mother-Baby Package: Implementing safe motherhood in countries, p. 9, 18

COST PER LIFE SAVED

	No. of Potential Deaths	No. of Deaths Averted	MBP Cost	Cost per Life Saved
Total Direct Cost	918	383	\$640,515	\$1,674
Total Recurrent Cost	918	383	\$769,267	\$2,011
Total Cost	918	383	\$908,099	\$2,374

Cost per life saved worksheet

The cost per life saved worksheet, shown in Screen printout 31 above, makes a rough calculation of the total cost per life saved by the intervention programme, based on the cost totals, the information in the demography worksheet, and broad assumptions about the effectiveness of the intervention programme. The only required user inputs to this worksheet are the maternal mortality ratio and the neonatal mortality rate. In light of the highly speculative nature of these estimates, their use should be limited to advocacy and other similar exercises.

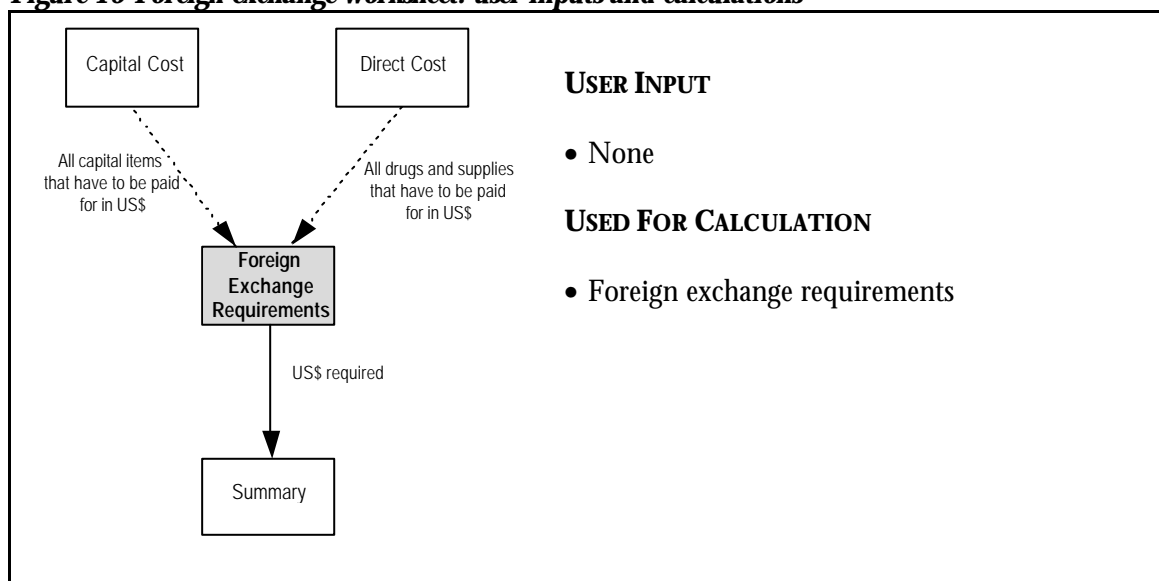
Foreign exchange worksheet

Not all of the drugs and medical equipment required to implement the *Mother-Baby Package* will be available locally. Some items will have to be purchased abroad, and paid for in foreign currency. The foreign exchange worksheet, described in Figure 15, provides health planners with an estimate of the local cost/imported cost breakdown.

Most of the imported cost, or foreign exchange requirement, will be incurred in the purchase of drugs or capital items such as surgery equipment or vehicles. When entering the cost of these items on the respective worksheets the user should mark all items that require an outlay of foreign currency.

The foreign exchange worksheet itself requires no user input; the model pulls all the necessary information from the drug list worksheet (Screen printout 32) and the capital cost worksheet (Screen printout 33).

Figure 15 Foreign exchange worksheet: user inputs and calculations



Both the drug list worksheet and the capital cost worksheet give the user the opportunity to mark foreign currency requirements. If a drug or capital equipment has to be purchased in US\$ then the user should put an **X** in the column provided for this purpose. The model will automatically calculate total foreign currency requirements.

Screen printout 32 Drug list worksheet (selected rows)

DRUG AND SUPPLY LIST						
Treatment line, form, strength	Supplier	Stock Number	Pack Price	Units per Pack	To be paid in US\$?	Unit Cost
Ampicillin, injection 1 g	IDA	000 4753	\$22.51	100	x	\$0.23
Ampicillin, tablets 500 mg	UNICEF	150 5048	\$6.06	100	x	\$0.06
Atropine 1mg/ml, injection 1ml	UNICEF	151 4010	\$0.78	10	x	\$0.08
Bag, urine collection, 2000 ml	UNICEF	033 0500	\$0.29	1	x	\$0.29
BCG vaccine, vial	UNICEF	000 2001	\$1.28	20	x	\$0.06
Benzathine benzylpenicillin, inj. 2.4M IU	UNICEF	155 9005	\$21.65	50	x	\$0.43
Blood giving set with needle, disposable	IDA	000 7133	\$33.92	100	x	\$0.34
Blood lancet, disposable	UNICEF	053 1995	\$4.43	250	x	\$0.02
Cannula, 18 G, disposable	UNICEF	070 9210	\$0.70	1	x	\$0.70
Cannula, 22 G, disposable	UNICEF	070 9225	\$0.69	1	x	\$0.69
Catheter, foley	UNICEF	000 3877	\$4.00	6	x	\$0.67
Chloramphenicol, injection 1 g	UNICEF	153 1030	\$2.43	5	x	\$0.49
Chlorhexidine concentrate, 5% solution	1 liter UNICEF	153 1505	\$2.72	20	x	\$0.14
Chloroquine, tablets 150 ml	UNICEF	153 2000	\$10.74	1,000	x	\$0.01
Cloxacillin, injection 500 ml	IDA	000 4774	\$19.30	100	x	\$0.19
Condoms	IDA	000 8408	\$5.50	144	x	\$0.04

Screen printout 33 Capital cost worksheet

ANNUALIZED CAPITAL COST											
Capital Cost	Amortization period (years)	To be paid in US\$?	Health Post			Health Centre			Hospital		
			Estimated construction cost/purchasing price	MBP share	Annualized depreciation	Estimated construction cost/purchasing price	MBP share	Annualized depreciation	Estimated construction cost/purchasing price	MBP share	Annualized depreciation
Facilities	20		\$10,000	50%	\$250	\$100,000	30%	\$1,500	\$1,000,000	20%	\$10,000
Furniture and Beds	7		\$1,000	50%	\$71	\$10,000	30%	\$429	\$100,000	20%	\$2,857
Refrigerators, Coolers	7	x	\$1,250	50%	\$89	\$1,950	30%	\$84	\$2,800	20%	\$80
Examination & Surgery Equipment	5	x	\$500	100%	\$100	\$2,000	100%	\$400	\$20,000	100%	\$4,000
Communications Equipment	2	x	\$500	50%	\$125	\$1,000	30%	\$150	\$2,500	20%	\$250
Vehicles	7	x	\$400	50%	\$29	\$20,000	30%	\$857	\$50,000	20%	\$1,429
Other	2	x	\$0	50%	\$0	\$0	30%	\$0	\$0	20%	\$0
TOTAL			\$13,650		\$664	\$134,950		\$3,419	\$1,175,300		\$18,616

Based on the information in these tables, the total costs are broken down by currency needs, as shown in Screen printout 34, taken from the summary worksheet.

Screen printout 34 Grand totals by foreign currency requirement (summary worksheet)

4. LOCAL / IMPORTED COST BREAKDOWN (foreign exchange requirements)									
	Blood Products	Drugs	Hospital Bed + Food	Lab Supplies	Personnel	Consumable Supplies	Transport (Petrol)	Facilities	Furniture and Beds
Local cost	\$5,832	\$0	\$69,614	\$0	\$394,844	\$0	\$0	\$62,500	\$17,857
Imported cost	\$0	\$74,243	\$0	\$3,881	\$0	\$86,948	\$5,154	\$0	\$0
Percent local	100%	0%	100%	0%	100%	0%	0%	100%	100%
Percent	0%	100%	0%	100%	0%	100%	100%	0%	0%
TOTAL	\$5,832	\$74,243	\$69,614	\$3,881	\$394,844	\$86,948	\$5,154	\$62,500	\$17,857

The foreign exchange worksheet contains three Excel “pivot” tables, which as mentioned earlier, do not update themselves automatically when the underlying data change. The “Update all summary tables” button on the direct cost worksheet will, however, update these tables.

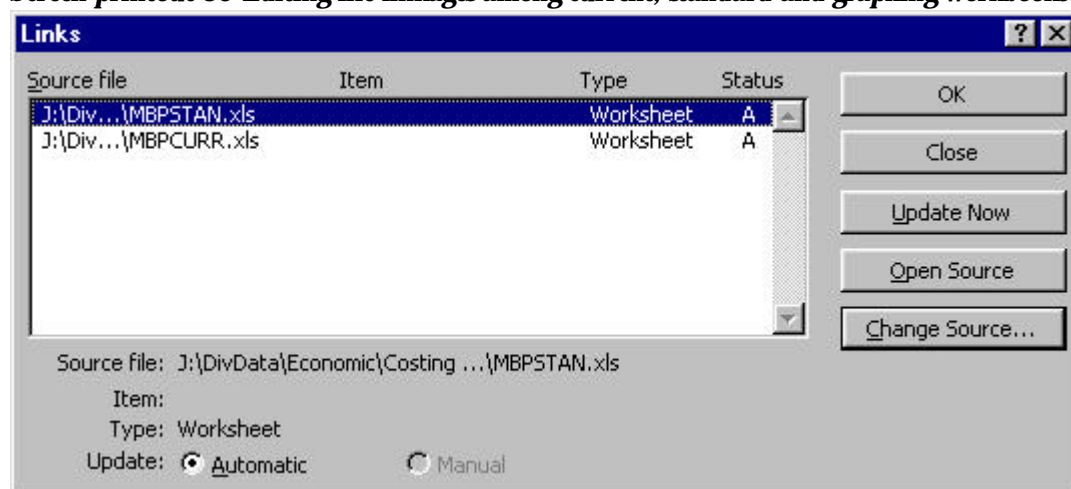
Part III. Calculating incremental costs and charting results

The model includes three files that link to the worksheets and depict the results graphically. Each file contains graphs that will help the user to interpret the results of the model. One file charts the cost associated with the current practice, the second the cost associated with the implementation of the standard, and the third one calculates and graphs the differences between the two, which represents the estimated incremental cost.

All of the graphs are already linked to the spreadsheet, so they will update themselves automatically when the files are opened. Samples of graphs are shown in Screen printout 36 and Screen printout 37.

The graphic files are originally linked to the filenames **MBPSTAN.xls** and **MBPCURR.xls**. If the user has renamed these two files or moved them to a different directory, it will be necessary to check whether the links in the graph files have changed accordingly. Opening the graph file and choosing the Links feature from the Edit menu does this; a screen resembling Screen printout 35 will appear. Should the link still be to the old file name or location, it can easily be changed. The re-linking is done by clicking on the “Change Source” button and choosing the correct file name from the file directory.

Screen printout 35 Editing file linkages among current, standard and graphing workbooks



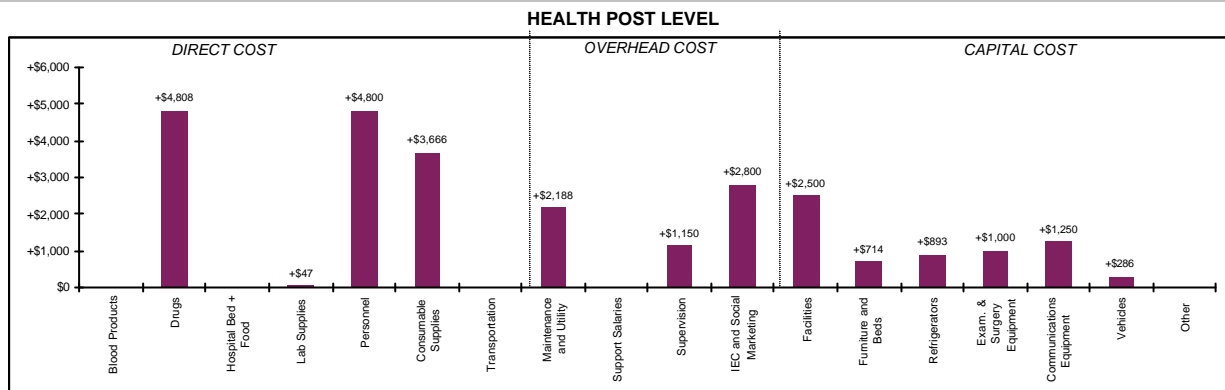
Checking and calibrating the model

The graphs will be invaluable for ensuring and checking the accuracy of the data and the correct workings of the model. Simply looking at the graphs can identify data entry mistakes or formula problems. For this purpose, the user should print out all the graphs and then study them for possible problems. Signs of a problem are outlying values—values that are much higher or lower than the others in the same range. If there is no logical explanation for the extreme nature of the outlying value, the user should check all the factors that have gone into the calculation of that value.

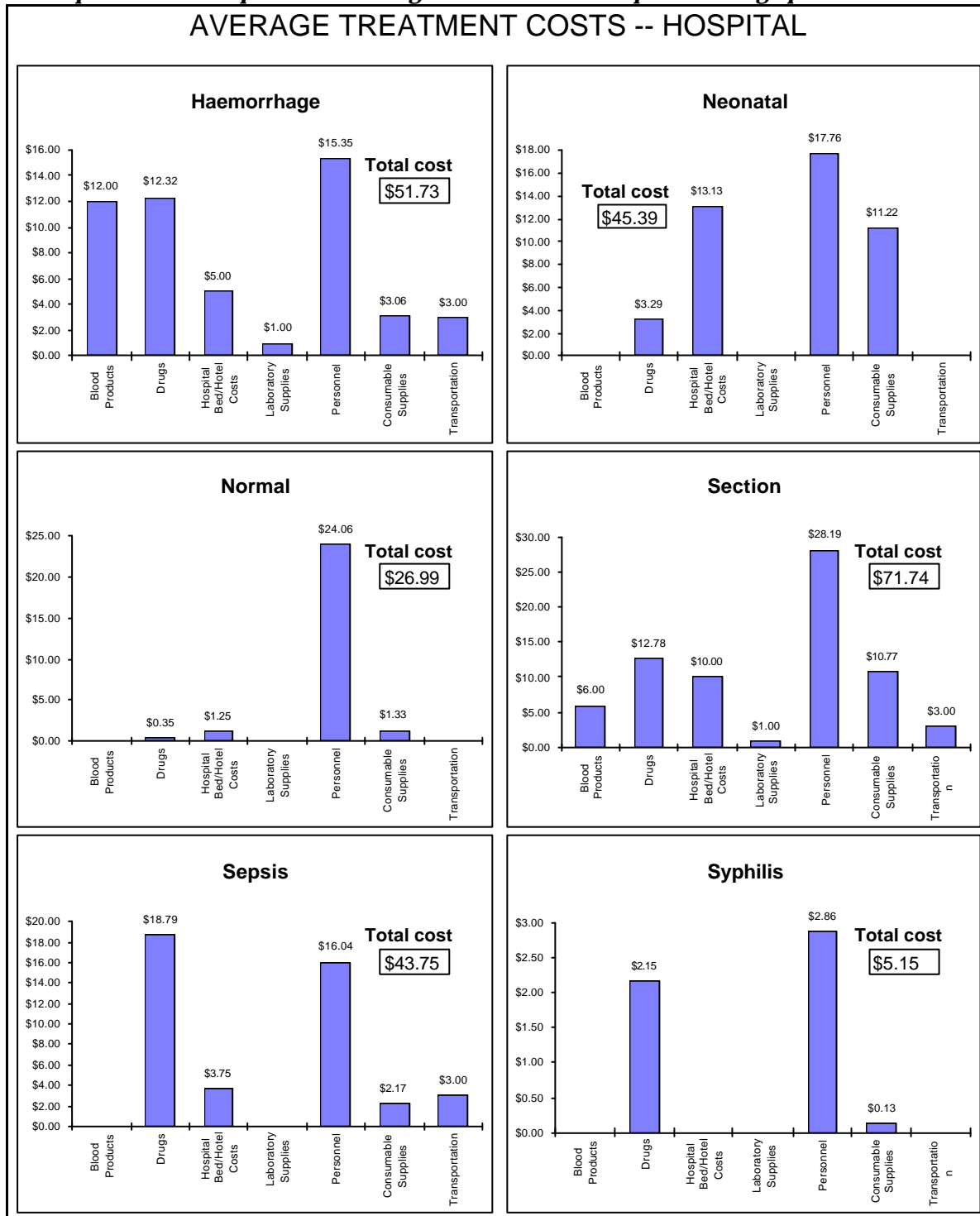
Another point to observe is the unexpected shape of a graph. One can assume, for instance, that the treatment cost for almost all interventions will be lowest at a health post, higher at a health centre and highest at a hospital. If this is not the case, one should question the accuracy of the input or check whether a formula is awry. As a general rule, anything that looks out of the ordinary should be investigated.

Screen printout 36 Sample chart of incremental cost from “graph” file

CHANGE IN TOTAL COST BY INPUT



Screen printout 37 Sample chart of average treatment cost at hospitals from "graph" file



Part IV. The *Mother-Baby Package* interventions

This section provides a closer look at the interventions of the *Mother-Baby Package* and how they are implemented in the model. It explains the scope of each intervention and the treatment protocols suggested at the health post, health centre and hospital level. It lists all the drugs and supplies needed and gives estimates of the clinical staff time that is required for the individual interventions.

The central interventions of the *Mother-Baby Package* are antenatal care, clean and safe delivery, and postpartum care, under the care of a skilled attendant. It is the goal of the *Mother-Baby Package* to provide as many women as possible with this care. Only some of the women will require the other interventions. Some women will be diagnosed with severe anaemia or STDs during their antenatal visits. Others will develop complications, such as eclampsia or haemorrhage during or after the delivery process.

The model treats these interventions as “add-on” interventions. This means that they only comprise those drugs, medical supplies and clinical staff time that such interventions incur in addition to the normal antenatal care visit or the normal delivery process. The “C-section” intervention, for instance, only contains those inputs that are necessary for the surgical procedure (e.g. anaesthesia, surgical supplies) and items that are specific to this intervention (e.g. a 7-day recuperation stay at the hospital). It does not include items such as antenatal care or routine newborn care, which are already covered under the “Normal Delivery” or antenatal intervention.

The information in this section is from the standard treatment model. Before this information can be used it must be critically assessed and adapted to match the setting in which the model is applied.

List of Intervention Groups

Antenatal Care	55
Anaemia, Severe.....	58
STD—Syphilis.....	61
STD—Other	63
Normal Delivery	65
Haemorrhage	68
Eclampsia	72
Obstructed Labour.....	75
Sepsis.....	78
Newborn Complications.....	80
Postpartum Care	83
Abortion Complications.....	85
Family Planning—Condom	92
Family Planning—Depo-Provera.....	93
Family Planning—IUD	94
Family Planning—Norplant	95
Family Planning—Oral Contraceptives.....	96
Family Planning—Sterilization	97

Intervention Group 1. Antenatal Care

Scope of intervention

The intervention “Antenatal Care” consists of comprehensive antenatal care services provided to all women, including, iron/folate supplementation and tetanus vaccination, malaria prophylaxis (where appropriate), diagnostic tests and treatment for STDs and severe anaemia.

If a woman is diagnosed with a condition such as severe anaemia, treatment is *not* included in the “Antenatal Care” intervention, but is included under the specific condition. For example, the treatment for severe anaemia is listed under “Anaemia, severe”. Treatment for syphilis is listed under “STD—Syphilis” and treatment of cervical and vaginal infections like gonorrhoea, chlamydia, and vaginosis can be found under “STD—Other”

Percentage of women receiving intervention

Since antenatal care is one of the central interventions of the *Mother-Baby Package*, planners should strive for a coverage rate which is as high as possible. While it would be desirable to provide quality antenatal care to every single pregnant woman in the district or country, a coverage rate of 90% is probably a more realistic objective in most cases.

From the demography worksheet:

Number of pregnant women

of which:

Percent of women receiving antenatal care..... 90%

of which:

From the direct cost worksheet:

Percent of these women who receive various interventions and treatment lines0-100%

Clinical management

Antenatal care should include anaemia screening and iron and folate supplementation; immunization against tetanus; advice on diet, rest and delivery care; blood pressure measurements to check for pre-eclampsia; taking of obstetric history; and completion of a maternal record for each woman so that signs of complications can be identified and appropriate actions taken.

Referral

Except for some of the laboratory tests, antenatal care can be provided even at the health post level. The model therefore assumes no referral between the different levels.

	HEALTH POST	HEALTH CENTRE	HOSPITAL
ANTENATAL CARE	<ul style="list-style-type: none"> Physical examination Iron supplementation Tetanus immunization Malaria prophylactic/treatment, if necessary Hookworm treatment, if necessary 	Same	Same
LAB TESTS	<ul style="list-style-type: none"> Urinary protein test 	<ul style="list-style-type: none"> RPR Syphilis test Haemoglobin test (anaemia screening) Blood group test Urinary protein test 	<ul style="list-style-type: none"> RPR Syphilis test Haemoglobin test (anaemia screening) Blood group test Urinary protein test
NUMBER OF VISITS REQUIRED	4	5	6
REFERRAL	0%	0%	–

Drugs and supplies

HEALTH POST, HEALTH CENTRE, AND HOSPITAL

Prophylactic vaccines and medication

Drug or supply	% of antenatal care clients receiving this treatment	Number	Times per day	Days per case	Notes
Tetanus vaccine, injection	100	1	1	2	Tetanus immunization
Ferrous salt+folic acid, tablets 60 mg+0.25 mg	100	1	3	90	Iron supplementation
Chloroquine	80*	1	2	3	Malaria prophylaxis/treatment
Mebendazole, tablets 100 mg*	30*	1	1	1	Hookworm treatment
Vitamin supplements	*				
Iodine supplement	*				For iodine deficiency

* Depending on prevalence in the area/national policy.

Lab tests (health centre and hospital)

Drug or supply	% of antenatal care clients receiving this treatment	Number	Times per day	Days per case	Notes
RPR Syphilis test	100	1	1	1	Syphilis test
Haemoglobin test	100	1	1	1	Test for anaemia
Blood group test	100	1	1	1	Blood group and Rh factor
Urinary protein test strips*	100	1	1	1	Every woman tested at first visit, problematic cases tested at every visit

* This test can also be performed at the health post.

Other

Drug or supply	% of antenatal care clients receiving this treatment	Number	Times per day	Days per case	Notes
Gloves	100	1	1	1	For physical exam
Clinic-based Record	100	1	1	1	
Home-based Mother's Record	100	1	1	1	

Clinical staff

Each of the four antenatal care visits should last at least 20 minutes, which adds up to a total of 80 minutes per woman. The model uses a more generous time estimate of 90 minutes per visit to include paperwork and various other time requirements related to the antenatal care visit.

At the health post, the pregnant woman will probably be seen by the auxiliary; at the health centre and the hospital, a registered nurse/midwife will be responsible for antenatal care. A lab technician at the health centre and the hospital is assumed to spend 15 minutes on lab tests.

Since the health centre and the hospital will probably see the more complicated cases, the default average number of antenatal visits there is 5 and 6, respectively. At the hospital, one of the visits is assumed to be with a gynaecologist.

HEALTH POST

	Auxiliary
Antenatal visit (h)	1.5

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Antenatal visit (h)	–	1.75	–	0.25

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Antenatal visit (h)	–	1.75	–	0.25	–	–	0.25

Hospitalization

No.

Transportation

No.

Intervention Group 2. Anaemia, Severe

Scope of intervention

The intervention “Anaemia” consists of the treatment of severe anaemia (defined as a haemoglobin concentration of below 7 g/dl). It does not deal with less severe forms of anaemia. Those cases are treated under “Antenatal Care” which supplies general iron and folate supplementation to every pregnant woman. It is assumed that the original diagnosis is done during the antenatal visit. The “Anaemia” intervention therefore does not include the initial test, only a follow-up anaemia test.

Percentage of women requiring intervention

From the demography worksheet:

Number of pregnant women

of which:

Assumed prevalence of severe anaemia..... 2.0%

of which:

From the direct cost worksheet:

Under 28 weeks 70%

Over 28 weeks with severe, but not *very* severe anaemia (Hb between 4 g/dl and 7 g/dl) 25%

Over 28 weeks with very severe anaemia (Hb <4 g/dl):..... 5%

Clinical management

Different treatment is provided at the different levels. There is no treatment at the health post level. The health centre will supply severely anaemic women who are up to 28 weeks pregnant with an extra 90-day supply of iron and folate pills (on top of the general supplementation they received in antenatal care); it will also be able to give total dose iron injections to women over 28 weeks pregnant. The hospital offers the same treatment options as well as blood or packed cell transfusions for the most severe cases.

Referral

Health Post: All women suspected of suffering from severe anaemia are referred for a lab test and treatment, since it is not possible to do any blood tests at this level. Women in their first and second trimester (up to 28 weeks) will be referred to the health centre (70%), women in their third trimester will be referred to the hospital (30%).

The health centre will refer 10% of all women to the hospital—mostly women with very severe anaemia (Hb level below 4 g/dl).

	HEALTH POST	HEALTH CENTRE	HOSPITAL
ASSESSMENT	<ul style="list-style-type: none"> Assess for paleness of tongue, conjunctivae (no lab facilities) during antenatal visit 	<ul style="list-style-type: none"> Haemoglobin test 	<ul style="list-style-type: none"> Haemoglobin test
TREATMENT	None	<ul style="list-style-type: none"> Iron+folate treatment (1. + 2. trimester) IM iron or total dose infusion of iron (3. trimester) 	<ul style="list-style-type: none"> Iron+folate treatment (1. + 2. trimester) IM iron or total dose infusion of iron (3. trimester) Blood transfusion (Hb <4 g/dl)
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	—	2	3
REFERRAL	100% (70% to health centre, 30% to hospital)	10%	—

Drugs and supplies

HEALTH CENTRE

Drug or supply	% of severely anaemic women receiving this treatment	Number	Times per day	Days per case	Notes
Haemoglobin test	100	1	1	1	In addition to antenatal test
Ferrous salt+folic acid, tablets 60 mg+0.25 mg	70	1	3	90	Women <28 weeks pregnant
Iron dextran, injection 50 mg/ml	30	1	1	1	For women >28 weeks pregnant
Folic acid, tablet 1 mg	30	1	1	90	For women receiving iron injection

HOSPITAL

Drug or supply	% of severely anaemic women receiving this treatment	Number	Times per day	Days per case	Notes
Haemoglobin test	100	1	1	1	In addition to antenatal test
Ferrous salt+folic acid, tablets 60 mg+0.25 mg	70	1	3	90	Women <28 weeks pregnant
Iron dextran, injection 50 mg/ml	25	1	1	1	For women >28 weeks pregnant
Blood group test	5	1	1	1	For women receiving blood transfusions
Blood transfusion	5	1	1	1	For very severe cases (below 4 g/dl, in late pregnancy)
Folic acid, tablet 1 mg	30	1	1	90	For women receiving iron injection

Clinical staff

The intervention does not require much staff time (two or three 15-minute visits at health centre and hospital). This time estimate includes not only assessment and treatment, but also counselling and paperwork. It is assumed that the same person who provides the antenatal care—a nurse or midwife—carries out the treatment.

HEALTH POST

	Auxiliary
Anaemia treatment	—

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Anaemia treatment (h)	—	2x0.25	—	0.25

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Anaemia treatment (h)	–	2x0.25	–	–	–	–	0.25

Hospitalization

No.

Transportation

No.

Intervention Group 3. STD—Syphilis

Scope of Intervention

The intervention “Syphilis” includes the treatment of syphilis for the pregnant woman, her partner and her baby.

The intervention does not include the testing for syphilis because it is assumed that the condition is discovered during the routine syphilis screening during antenatal care. The test is therefore included there. Tetracycline eye ointment is included in “Normal Delivery” because it is considered part of routine newborn care and every baby will receive it, not only babies whose mothers have been diagnosed with syphilis.

Percentage of women requiring intervention

From the demography worksheet:

Number of pregnant women

of which:

Assumed prevalence of syphilis..... 3%

of which:

From the direct cost worksheet:

Receive various treatment lines..... 0-100%

Clinical management

The treatment of syphilis is uncomplicated and is the same for health post, health centre and hospital. It consists of a one-dose benzylpenicillin injection for the woman, her partner, and the baby. Clients who are allergic to penicillin will receive a 2-week oral treatment of erythromycin.

Referral

Since the treatment is simple and can be administered even at a health post, it is assumed that no referral is necessary.

	HEALTH POST	HEALTH CENTRE	HOSPITAL
ASSESSMENT	<ul style="list-style-type: none"> During antenatal care visit 	Same	Same
TREATMENT	<ul style="list-style-type: none"> 1 injection of penicillin, or if client allergic to penicillin, erythromycin tablets for 2 weeks 	Same	Same
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	6 (treatment + follow-up visit each for woman, partner, baby)	Same	Same
REFERRAL	–	–	–

Drugs and supplies

HEALTH POST, HEALTH CENTRE, AND HOSPITAL

Syphilis test (during antenatal care visit)

Drug or supply	% of women receiving this treatment	Number	Times per day	Days per case	Notes
RPR Syphilis test	100	1	1	1	Syphilis test for woman

Treatment of woman and partner

Drug or supply	% of women with syphilis receiving this treatment	Number	Times per day	Days per case	Notes
Benzathine benzylpenicillin, injection 2.4 MIU	95	2	1	1	For woman/partner (1 inj. each)
Erythromycin, capsule 250 mg	5	4	4	14	For woman/partner allergic to penicillin (2 capsules each)
Distilled water, injection 5 ml	95	2	1	1	
Syringe, 5 ml + needle	95	2	1	1	

Treatment of baby

Drug or supply	% of babies of mothers with syphilis receiving this treatment	Number	Times per day	Days per case	Notes
Benzathine benzylpenicillin, inj. 2.4 MIU	100	1	1	1	
Distilled water, injection 5 ml	100	1	1	1	
Syringe, 5 ml + needle	100	1	1	1	

Clinical staff

The intervention does not require much staff time (15 minutes for each of the persons treated—woman, partner, baby—which adds to 45 minutes total). This includes the medical treatment as well as counselling and paperwork. It is assumed that the same person who provides the antenatal care—an auxiliary in the case of the health post and a nurse/midwife at health centre and hospital—carries out the treatment.

HEALTH POST

	Auxiliary
Treatment (h)	0.5

HEALTH CENTRE

	Auxiliary	Nurse/Midwife	General Physician	Lab Technician
Treatment (h)	–	0.5	–	–

HOSPITAL

	Auxiliary	Nurse/Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Treatment (h)	–	0.5	–	–	–	–	–

Hospitalization

No.

Transportation

No.

Intervention Group 4. STD—Other

Scope of intervention

The intervention “STD—Other” includes the treatment of all STDs other than syphilis—cervical infections (gonorrhoea, chlamydia) as well as vaginal infections (trichomonosis, BV).

Percentage of women requiring intervention

From the demography worksheet:

Number of pregnant women

of which:

Assumed prevalence..... 10%

of which:

From the direct cost worksheet:

Vaginal infections (vaginosis, etc.) 10%

Cervical infections (gonorrhoea and chlamydia)..... 90%

Clinical management

- a) Cervical infections: Since these cases are highly contagious, treatment is provided not only to the woman but also to her partner. Because differentiation between gonorrhoea and chlamydia is difficult, the woman and her partner are treated for both conditions.
- b) Vaginal infections: Since the risk of partner infection is very low in these cases, only the woman is treated.

Referral

Because cervical and vaginal infections can be treated even at the health post level, there is no need for referral.

	HEALTH POST	HEALTH CENTRE	HOSPITAL
ASSESSMENT	<ul style="list-style-type: none"> During antenatal care visit (and therefore not costed in STD section of direct cost worksheet) 	Same	Same
TREATMENT	<ul style="list-style-type: none"> <u>Cervical infections</u>: treated for both gonorrhoea and chlamydia. Ceftriaxone injection and erythromycin (woman)/ doxycycline (partner) tablets <u>Vaginal infections</u>: only woman treated Metronidazole and Cotrimoxazole tablets 	Same	Same
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	4 (1 treatment and follow-up visit each for woman and partner)	4	4
REFERRAL	–	–	–

Drugs and supplies

HEALTH POST, HEALTH CENTRE, AND HOSPITAL

Treatment of cervical infections

Drug or supply	% of women with STDs other than syphilis receiving this treatment	Number	Times per day	Days per case	Notes
Ceftriaxone, injection 250 mg	10	2	1	1	Gonorrhoea treatment for woman and partner (1 injection each)
Syringe, 5 ml + needle	10	2	1	1	For ceftriaxone injection
Erythromycin, capsule 250 mg	10	2	4	7	Chlamydia treatment for woman
Doxycycline, tablet 100 mg*	10	1	2	7	Chlamydia treatment for partner

* The woman's partner is treated with Doxycycline, which is substantially cheaper than Erythromycin.

Treatment of vaginal infections

Drug or supply	% of women with STDs other than syphilis receiving this treatment	Number	Times per day	Days per case	Notes
Metronidazole, tablets 250 mg	90	2	2	7	
Cotrimoxazole (Sulfamethoxazole + Trimethoprim), 400 mg+80 mg	90	1	1	1	

Clinical staff

The intervention does not require much staff time (15 minutes each for woman and partner). It is assumed that the same person who provides the antenatal care—an auxiliary in the case of the health post and a nurse/midwife at health centre and hospital—carries out the treatment.

HEALTH POST

	Auxiliary
Treatment (h)	2x0.25

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Treatment (h)	–	2x0.25	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Treatment (h)	–	2x0.25	–	–	–	–	–

Hospitalization

No.

Transportation

No.

Intervention Group 5. Normal Delivery

Scope of intervention

The intervention “Normal Delivery” covers *that* part of the delivery process that is the same for every delivery, regardless of whether the delivering woman develops complications or not. This covers the management of the birth through the third stage of labour as well as basic newborn care.

All deliveries will incur, as a minimum, these costs. Women who develop complications will then incur additional costs, which are dealt with under the individual complications, such as “Eclampsia”, “Sepsis”, etc. A post-delivery check-up is covered under “Postpartum Care”.

Percentage of women receiving intervention

Like antenatal care, a delivery under the supervision of a skilled attendant is an integral part of the *Mother-Baby Package*. Planners should strive to set this coverage rate as high as possible. The current coverage rate should serve as a guideline in establishing a goal that is realistic and feasible. (See Appendix C for a country-by-country listing of current delivery coverage rates.)

From the demography worksheet:

Number of pregnant women

of which:

Percent of deliveries performed by a skilled attendant 80%

of which:

From the direct cost worksheet:

Percent of these women who receive various interventions and treatment lines 0-100%

Clinical management

As specified in the *Mother-Baby Package*, skilled personnel should attend each birth.¹² While it is recommended that births take place at a health centre, it is possible to perform a clean and safe delivery at home as long as a skilled nurse or midwife attends the birth and referral to a medical facility is possible should complications arise. The nurse/midwife who assists a birth at home will use the same safe and clean delivery kit as the nurse/midwife assisting a birth at the health centre. Only in rare cases will a normal delivery require an overnight stay at the medical facility. An episiotomy is assumed to be necessary in 25% of all births and repair of perineal tears in about 50%. The model assumes that the partograph is used for all births.

Referral

In the standard model, no planned births take place at the health post. If a woman presents at a health post for normal birth, she is immediately referred to a nearby health centre or a skilled nurse or midwife who is based at that health centre. Normally, this situation should not arise that often as women should have been informed and counselled on the best place to deliver during their antenatal care visits.

¹² This is defined as a skilled nurse, midwife, medical doctor, or other health personnel with competency in midwifery skills; trained and untrained “traditional birth attendants” are excluded.

	HEALTH POST	HEALTH CENTRE	HOSPITAL
DELIVERY	Not offered	<ul style="list-style-type: none"> Clean and safe delivery Basic newborn care 	Same as health centre
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	–	1	1
REFERRAL	100% to health centre	–	–

Drugs and supplies

HEALTH POST

No delivery care.

HEALTH CENTRE, AND HOSPITAL

Basic supplies for clean and safe delivery

Drug or supply	% of women receiving this treatment	Number	Times per day	Days per case	Notes
Gloves	100	1	4	1	
Oxytocin, injection 10 IU	100	1	1	1	Active mgmt. of 3rd stage of labour
Paracetamol, tablets 500 mg	50	1	4	1	Pain management (general)
Delivery record (clinic-based)	100	1	1	1	

Episiotomy and repair of tears

Drug or supply	% of women receiving this treatment	Number	Times per day	Days per case	Notes
Lidocaine 2%, injection 50 ml	50	1	1	1	Local anaesthesia for episiotomy or repair of perineal tears
Catgut suture	50	1	1	1	
Sterile pad	50	1	1	1	

Newborn care

Drug or supply	% of newborns receiving this treatment	Number	Times per day	Days per case	Notes
Umbilical tape	100	1	1	1	Cord care
Tetracycline, eye ointment 1%	100	1	1	1	Conjunctivitis
Mucus extractor	5	1	1	1	Newborn resuscitation

Clinical staff

We assume that a normal, non-complicated birth on average will take up about 6 hours of nurse or midwife's time at the health centre or hospital. The nurse/midwife will not have to be present for the whole six hours. Part of the work can be done by an auxiliary/attendant.

HEALTH POST

No delivery services provided.

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Delivery (h)	2	4	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Delivery (h)	2	4	–	–	–	–	–

Hospitalization

Normally, no overnight stay is required for a normal birth. It is assumed, however, that women who give birth at a health centre or hospital late in the afternoon or at night will not be sent home immediately after delivery, but will spend a night there (50% of all women). Assuming that only 50% of the births at the health centre actually take place there—the remaining 50% are performed at the woman's home under the supervision of a nurse/midwife employed by the health centre—only 25% of women will require a night's stay at the health centre.

	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Health centre bed	25	1	1	1	
Hospital bed	50	1	1	1	

Transportation

No.

Intervention Group 6. Haemorrhage

Scope of intervention

The intervention “Haemorrhage” refers to postpartum haemorrhage.

Percentage of women requiring intervention

From the demography worksheet:

Number of pregnant women

of which:

Percent of births requiring management of postpartum haemorrhage 10%

of which:

From the direct cost worksheet:

Percent of these women who receive various interventions and treatment lines0-100%

Clinical management

The treatment consists of IM/IV oxytocin immediately after delivery, uterine massage, catheterization of bladder if necessary, repair of tears, fluids and blood transfusion and referral, as necessary.

Referral

After initiation of treatment, the health post should refer all cases to a higher level in the health system. The health centre will refer about half of all cases to the hospital.

	HEALTH POST	HEALTH CENTRE	HOSPITAL
TREATMENT	–	<ul style="list-style-type: none"> • IM/IV oxytocin immediately after delivery • uterine massage • catheterization of bladder if necessary • repair of tears, and • fluids 	<ul style="list-style-type: none"> • IM/IV oxytocin immediately after delivery • uterine massage • catheterization of bladder if necessary • repair of tears • fluids, and • blood transfusion
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	–	50% will require 2 days	50% will require 7 days
REFERRAL	100% 50% health centre, 50% hospital	50% to hospital	–

Drugs and supplies

HEALTH CENTRE

Drug or supply	% of women with sepsis receiving this treatment	Number	Times per day	Days per case	Notes
Ampicillin, injection 1 g	50	1	3	2	Antibiotics IV
Diazepam 5 mg/ml, injection 2 ml	100	1	1	1	Sedation, local anaesthesia
Doxycycline, tablet 100 mg	50	1	2	10	Follow-up antibiotics treatment
Gentamicin 40 mg/ml, injection 2 ml	50	3	2	2	Antibiotics IV
Lidocaine 1%, injection 50 ml	50	1	1	1	Local anaesthesia
Metronidazole 5 mg/ml, injection 100 ml	50	1	2	2	Antibiotics IV
Oxytocin 10 IU/ml, injection 1 ml	100	2	1	1	Oxytocic
Paracetamol, tablets 500 mg	50	1	3	2	Pain management
Pethidine 50 mg/ml, injection 1 ml	50	1	1	1	Analgesic
Sodium lactate (Ringer) + set, solution 500 ml	100	4	1	1	All haemorrhage
Blood group test	100	1	1	1	Blood group and Rh
Haemoglobin test	100	1	1	1	Haemoglobin test
Blood lancet, disposable	100	1	1	1	Take blood sample
Catheter, foley	100	1	1	1	Measure urine output
Gauze pad, sterile, 12 ply 76x76	50	1	1	1	
Gloves, surgeons, disposable, pair	100	4	1	1	
Infusion giving set with needle, disposable	100	1	1	1	All haemorrhage
Oxygen, 100 l	10	4.5	1	1	Shock: oxygen 1 h at 6-8 l/min
Suture needle, assorted sizes, round body	50	3	1	1	Suture, interior and exterior
Suture, catgut chromic 0, 150 cm	50	1	1	1	Suture
Suture, catgut chromic 1, 150 cm	50	1	1	1	Suture
Suture, catgut ob. sterile w/needle	50	1	1	1	Suture
Suture, catgut plain 2/0, 150 cm	50	1	1	1	Suture
Syringe, 5 ml, dispos+needle+swab	100	1	1	1	Diazepam injection

HOSPITAL

Drug or supply	% of women with sepsis receiving this treatment	Number	Times per day	Days per case	Notes
Blood, one unit	10	2	1	1	Blood transfusion
Ampicillin, injection 1 g	50	1	3	2	Antibiotics IV
Diazepam 5 mg/ml, injection 2 ml	80	1	1	1	Sedation, local anaesthesia
Doxycycline, tablet 100 mg	50	1	2	10	Follow-up antibiotics treatment
Gentamicin 40 mg/ml, injection 2 ml	50	3	2	2	Antibiotics IV
Halothane gas	20	1	1	1	General anaesthesia
Lidocaine 1%, injection 50 ml	50	1	1	1	Local anaesthesia
Metronidazole 5 mg/ml, injection 100 ml	50	1	2	2	Antibiotics IV
Oxytocin 10 IU/ml, injection 1 ml	100	2	1	1	Oxytocic
Paracetamol, tablets 500 mg	50	1	3	2	Pain management
Pethidine 50 mg/ml, injection 1 ml	75	1	1	1	Analgesic
Sodium citrate, 0.3 mol/l, 480 ml	20	1	1	1	General anaesthesia
Sodium lactate (Ringer) + set, solution 500 ml	20	6	1	1	IV fluid during general anaesthesia
Sodium lactate (Ringer) + set, solution 500 ml	100	4	1	1	All haemorrhage
Suxamthonium 50 mg/ml, injection 2 ml	20	1	1	1	General anaesthesia
Thiopental, injection 1 g	20	1	1	1	General anaesthesia
Blood group test	100	1	1	1	Blood group and Rh
Haemoglobin test	100	1	1	1	Haemoglobin test
Blood giving set with needle, disposable	10	2	1	1	For blood transfusion
Blood lancet, disposable	100	1	1	1	Take blood sample
Catheter, foley	100	1	1	1	Measure urine output
Gauze pad, sterile, 12 ply 76x76	50	1	1	1	
Gloves, surgeons, disposable, pair	100	4	1	1	
Infusion giving set with needle, disposable	100	1	1	1	All haemorrhage
Nitrous oxide, 100 l	20	1	1	1	General anaesthesia
Oxygen, 100 l	20	4.5	1	1	General anaesthesia, 1 h at 6-8 l/min
Oxygen, 100 l	10	4.5	1	1	Shock: oxygen 1 h at 6-8 l/min
Suture needle, assorted sizes, round body	75	3	1	1	Suture, interior and exterior
Suture, catgut chromic 0, 150 cm	75	1	1	1	Suture
Suture, catgut chromic 1, 150 cm	75	1	1	1	Suture
Suture, catgut ob. sterile w/needle	75	1	1	1	Suture
Suture, catgut plain 2/0, 150 cm	75	1	1	1	Suture
Syringe, 5 ml, dispos+needle+swab	80	1	1	1	Diazepam injection
Syringe, 5 ml, dispos+needle+swab	20	1	1	1	For thiopental (general anaesthesia)
Water for injection, 5 ml	20	1	1	1	For thiopental (general anaesthesia)

Clinical staff

A nurse/midwife will provide most of the care for women with haemorrhage. A doctor (a general physician at the health centre and an obstetrician at the hospital) will spend 15 minutes with the woman. At both health centre and the hospital a lab technician will spend 15 minutes on lab tests. Half an hour of an auxiliary's time is scheduled for care during each day the woman is hospitalized.

HEALTH POST

	Auxiliary
Haemorrhage treatment	–

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Haemorrhage treatment (h)	1	2	1	0.25
Care during recovery				

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Haemorrhage management (h)	2	2		1		1	0.25
Care during recovery (h)	2.5						

Hospitalization

Of the women treated for haemorrhage at the health centre, half will need to stay for 2 days. Since the hospital treats more severe cases, the average hospital stay is 7 days.

	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Health centre bed	50	1	1	2	
Hospital bed	50	1	1	7	

Transportation

Emergency transportation will be needed in 20% of the cases.

Intervention Group 7. Eclampsia

Scope of intervention

The intervention “Eclampsia” covers the treatment of eclampsia as well as the caesarean delivery, which is necessary in approximately 10% of eclampsia cases.

Percentage of women requiring intervention

From the demography worksheet:

Number of pregnant women

of which:

Number of births

of which

Incidence of eclampsia in these women..... 0.5%

of which:

From the direct cost worksheet:

Women requiring emergency caesarean delivery 10%

Clinical management

Eclampsia is one of the most fatal complications of pregnancy. Women showing signs of eclampsia should be transferred to the nearest hospital without delay. The woman needs to be stabilized—before and during the transfer (control of convulsions and hypertension, intravenously or if that is not possible, IM). A trained midwife or nurse needs to accompany the woman on the transfer. (A more in-depth study should include these preparation and transfer costs, which can be quite substantial. The model, as it stands, only includes the treatment costs at the hospital.)

Referral

Only the hospital will be able to provide complete treatment for eclampsia complications (100% referral from health post and health centre).

	HEALTH POST	HEALTH CENTRE	HOSPITAL
ASSESSMENT	–	–	<ul style="list-style-type: none"> • Blood pressure measurement • Protein urine test
TREATMENT	<ul style="list-style-type: none"> • Control of convulsions with diazepam • Immediate accompanied referral 	<ul style="list-style-type: none"> • Control of convulsions with diazepam • Control of hypertension with hydralazine • Immediate referral accompanied by qualified medical personnel 	<ul style="list-style-type: none"> • Manage hypertension • Manage convulsions • Deliver • If necessary, caesarean delivery
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	–	–	7
REFERRAL	100% to hospital	100%	–

Drugs and supplies

HOSPITAL

Drug or supply	% of eclampsia patients receiving this treatment	Number	Times per day	Days per case	Notes
Blood lancet, disposable	100	1	1	1	For blood count
Complete blood count	100	1	1	1	
Urine test	100	1	1	1	Test for proteinuria
Oxygen, 4-6 l/min	10				
Infusion giving set, with needle	100	1	1	1	
Sodium lactate, 500 ml	100	6	1	1	Control of fluid balance
Diazepam, 10 mg IM or IV	100	1	4	1	Management of convulsions
Hydralazine, 20 mg IV	100	1	2	1	Management of hypertension
5% glucose, 500 ml	100	1	2	1	For drip
Foley catheter + urine bag, 2000 ml	100	1	1	1	Measurement of urine output
Oxytocin, 10 ml	50	1	1	1	Induction of labour

General anaesthesia for emergency caesarean delivery

Drug or supply	% of eclampsia patients receiving this treatment	Number	Times per day	Days per case	Notes
Infusion giving set with needle	10	1	1	1	
Sodium lactate (Ringer) + set, 500 ml	10	6	1	1	IV fluid
Sodium citrate, 0.3 mol/l, 30 ml	10	1	1	1	Antacid
Thiopental, injection 1 g	10	1	1	1	
Suxamthonium 50 mg/ml, injection 2 ml	10	1	1	1	
Catheter, foley + urine collection bag	10	1	1	1	To measure urine output
Halothane gas, 5 ml	10	1	1	1	
Nitrous oxide, 100 l	10	1	1	1	1 h at 2 l/min
Oxygen, 100 l	10	1	1	1	1 h at 1 l/min. + pre-oxygenation

Surgical procedure (emergency caesarean delivery)

Drug or supply	% of eclampsia patients receiving this treatment	Number	Times per day	Days per case	Notes
Povidone iodine solution 10%	10	1	1	1	Antiseptic
Gloves, surgeons	10	4	1	1	
Suture, catgut chromic 0, 150 cm	10	1	1	1	Suture, interior
Suture, catgut chromic 1, 150 cm	10	1	1	1	Suture, interior
Suture, silk, 2 x 0.75 m	10	1	1	1	Suture, exterior
Suture needle, assorted sizes, round body	10	3	1	1	

Other

Drug or supply	% of eclampsia patients receiving this treatment	Number	Times per day	Days per case	Notes
Ampicillin, injection 1 g	10				Pre-op antibiotics prophylaxis
Oxytocin 10 IU/ml, injection 1 ml	10	2	1	1	After surgery
Pethidine 50 mg/ml, injection 1 ml	10	1	1	1	Pain management after surgery
Paracetamol, tablets 500 mg	10	1	4	3	Pain management during recovery

Clinical staff

Eclampsia is the most staff-intensive of all the interventions in the *Mother-Baby Package*. The eclampsia patient will have to be watched by a nurse/midwife almost around the clock for two or three days.

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Eclampsia treatment (h)	12	24	–	2	–	1 (10%)	0.25

Hospitalization

	% eclampsia patients receiving this treatment	Number	Times per day	Days per case	Notes
Hospital bed	100	1	1	7	

Transportation

Emergency transportation will be needed in referral of all eclampsia cases.

Intervention Group 8. Obstructed Labour

Scope of intervention

The intervention “Obstructed Labour” deals with those deliveries that end in caesarean delivery. It does not include those parts of the delivery that are identical to a normal delivery, such as the care preceding the decision to perform a caesarean delivery or routine care of the newborn. All these are all listed under “Normal Delivery”.

Percentage of women requiring intervention

From the demography worksheet:

Number of pregnant women

of which:

Number of births

of which:

Deliveries that require caesarean delivery..... 5%

of which:

From the direct cost worksheet:

Requiring emergency caesarean delivery (general anaesthesia)..... 20%

Non-emergency caesarean delivery (spinal anaesthesia) 80%

Clinical management

Since in most caesarean deliveries spinal anaesthesia is quite sufficient, the model assumes that 80% of all caesarean deliveries are performed that way. The other 20% are assumed to require general anaesthesia.

These numbers may vary from country to country. Some countries perform *all* caesarean deliveries under general anaesthesia. The user can change the percentages to reflect those local standards.

Referral

All women who require a caesarean delivery have to be referred to the hospital.

	HEALTH POST	HEALTH CENTRE	HOSPITAL
TREATMENT	–	–	• Caesarean delivery (spinal and general anaesthesia)
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	–	–	7
REFERRAL	100%	100%	–

Drugs and supplies

Lab tests

Drug or supply	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Haemoglobin test	100	1	1	1	Test for anaemia
Blood group test	100	1	1	1	

Both spinal and general anaesthesia

Drug or supply	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Infusion giving set with needle	100	1	1	1	
Sodium lactate (Ringer) + set, 500 ml	100	6	1	1	IV fluid

General anaesthesia

Drug or supply	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Sodium citrate, 0.3 mol/l, 30 ml	20	1	1	1	Antacid
Thiopental, injection 1 g	20	1	1	1	
Suxamthonium 50 mg/ml, injection 2 ml	20	1	1	1	
Catheter, foley + urine collection bag	20	1	1	1	To measure urine output
Halothane gas, 5 ml	20	1	1	1	
Nitrous oxide, 100 l	20	1	1	1	1 h at 2 l/min
Oxygen, 100 l	20	1	1	1	1 h at 1 l/min + pre-oxygenation

Spinal anaesthesia

Drug or supply	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Lidocaine 5%, spinal heavy (with dextrose 5%), 2 ml	80	6	1	1	IV fluid
Syringe, 10 ml with needle	80	1	1	1	

Surgical procedure

Drug or supply	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Povidone iodine solution 10%	100	1	1	1	Antiseptic
Gloves, surgeons	100	4	1	1	
Suture, catgut chromic 0, 150 cm	100	1	1	1	Suture, interior
Suture, catgut chromic 1, 150 cm	100	1	1	1	Suture, interior
Suture, silk, 2 x 0.75 m	100	1	1	1	Suture, exterior
Suture needle, assorted sizes, round body	100	3	1	1	

Other

Drug or supply	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Ampicillin, injection 1 g					Pre-op antibiotics prophylaxis
Oxytocin 10 IU/ml, injection 1 ml	100	2	1	1	After surgery
Blood, one unit	5	2	1	1	In case of severe blood loss
Blood giving set	5	1	1	1	For blood transfusion
Pethidine 50 mg/ml, injection 1 ml	100	1	1	1	Pain management after surgery
Paracetamol, tablets 500 mg	100	1	4	3	Pain management during recovery

Clinical staff

A nurse/midwife will spend 2 hours with the woman. The surgical procedure itself is assumed to take 1 hour of obstetrician, 1 hour of anaesthetist, and 1 hour of assistant time. To this is added 0.25 hours of lab time. Care of the recuperating woman (7-day hospital stay) will require 3.5 hours of auxiliary time.

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Surgery (h)	1	2	–	1	–	1	0.25
Care during recuperation at hospital (h)	3.5	–	–	–	–	–	–

Hospitalization

All women who have had a caesarean delivery will require 7 days at the hospital.

	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Hospital bed	100	1	1	7	

Transportation

Emergency transportation will be needed in 20% of the cases.

Intervention Group 9. Sepsis

Scope of intervention

The intervention “Sepsis” deals with puerperal sepsis. It does not include treatment of sepsis caused by abortions which is included under “Abortion Complications”.

Percentage of women requiring intervention

From the demography worksheet:

Number of pregnant women

of which:

Percent of births requiring management of puerperal sepsis 8%

of which:

From the direct cost worksheet:

Percent of these women who receive various interventions and treatment lines 0-100%

Clinical management

The treatment consists of antibiotics, which are given IV or IM for the first 2 days, after that orally for 10 days.

Referral

After initiation of antibiotic treatment, the health post should refer all sepsis cases to a higher level in the health system. The health centre will refer the most severe cases (10%).

	HEALTH POST	HEALTH CENTRE	HOSPITAL
TREATMENT	–	<ul style="list-style-type: none"> • Antibiotics treatment • If necessary, treatment of shock 	<ul style="list-style-type: none"> • Antibiotics treatment • If necessary, treatment of shock
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	–	2	4
REFERRAL	100% 50% health centre, 50% hospital	50%	–

Drugs and supplies

HEALTH CENTRE AND HOSPITAL

Drug or supply	% of women with sepsis receiving this treatment	Number	Times per day	Days per case	Notes
Oxygen (hospital only)	10	1	1	1	In case of shock: 3 h at 6-8 l/min
Sodium chloride, 500 ml	100	6	1	1	Shock/antibiotics IV
Ampicillin, 1 g IV	100	1	6	2	Antibiotics IV (for 2 days)
Gentamicin 40 mg/ml, injection 2 ml	100	1	3	2	Antibiotics IV (for 2 days)
Metronidazole, 1 g IV	100	1	2	2	Antibiotics IV (for 2 days)
IV set with needle	100	1	1	1	For antibiotics IV
Doxycycline, tablets 100 mg	100	1	2	10	Follow-up treatment (for 10 days)
Foley catheter, urine collection bag	100	1	1	1	Control of urine output
Complete blood count	100	1	1	1	Lab test
Paracetamol, tablets 500 mg	50	1	4	2	Pain management, if necessary

Clinical staff

A nurse/midwife will provide most of the care for women with sepsis. A doctor (a general physician at the health centre and an obstetrician at the hospital) will spend 15 minutes with the woman. At both health centre and the hospital a lab technician will spend 15 minutes on lab tests. Half an hour of an auxiliary's time is scheduled for care during each day the woman is hospitalized.

HEALTH POST

Auxiliary
–

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Sepsis treatment (h)	–	1	0.25	0.25
Care during recovery (h)	1	–	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Sepsis treatment (h)	–	1	–	0.25	–	–	0.25
Care during recovery (h)	2	–	–	–	–	–	–

Hospitalization

Of the women treated for sepsis at the health centre, half will need to stay for 2 days. Since the hospital treats more severe cases, the average hospital stay is 4 days.

	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Health centre bed	50	1	1	2	
Hospital bed	100	1	1	4	

Transportation

Emergency transportation will be needed in 10% of the cases.

Intervention Group 10. Newborn Complications

Scope of intervention

The intervention “Neonatal Complications” comprises all interventions directed at the newborn with complications. These complications include difficulties breathing, bacterial infections, hypoxic ischemic encephalopathy, ophthalmia as well as care of the pre-term/LBW newborn. Neonatal eye care is listed under “Normal Delivery” as part of routine newborn care.

Percentage of neonates requiring intervention

From the demography worksheet:

Number of pregnant women

of which:

Percent carried to term/live births

of which:

Percent of newborns with complications 20%

of which:

From the direct cost worksheet:

Percent of these women who receive various interventions and treatment lines 0-100%

Severe bacterial infection 25%

Local bacterial infection 50%

Hypoxic ischemic encephalopathy 5%

Pre-term newborn 15%

Ophthalmia 15%

Congenital syphilis 10%

These complications do not add up to 100%, since they are not mutually exclusive—a newborn can suffer several complications simultaneously.

Treatment

The health centre should be able to resuscitate newborns and provide routine neonatal eye care (contained in the intervention “Normal Delivery”). All other neonatal complications should be treated at the hospital.

Referral

All newborns presenting with complications should be referred to the hospital.

	HEALTH POST	HEALTH CENTRE	HOSPITAL
TREATMENT	–	<ul style="list-style-type: none"> • Resuscitation 	<ul style="list-style-type: none"> • Resuscitation • Treatment of bacterial infections • Treatment of hypoxic ischemic encephalopathy • Care for the pre-term newborn • Treatment of ophthalmia • Treatment of congenital syphilis
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	–	–	7
REFERRAL	100% to hospital	100%	–

Drugs and supplies

HOSPITAL**Severe bacterial infection**

Drug or supply	% newborn complications receiving this treatment	Number	Times per day	Days per case	Notes
Ampicillin, injection 1 g	25	1	2	10	(3 days IV, 7 days IM)
Benzathine benzylpenicillin, inj. 2.4 M IU	25	1	1	1	
Gentamicin 10 mg/ml, injection 2 ml	25	1	2	10	(3 days IV, 7 days IM)
Syringe, 2 ml, disposable+needle+swab	25	2	2	7	For antibiotics IM
Erythromycin syrup, 50 mg/kg	5	1	4	14	

Severe bacterial infection/pre-term newborn

Drug or supply	% newborn complications receiving this treatment	Number	Times per day	Days per case	Notes
Dextrose 10%, in water, 500 ml	30	1	1	3	For antibiotics IV
Infusion set, paediatric	30	1	1	3	For antibiotics IV
Cannula, 22 G, disposable	30	1	1	3	
Feeding tube	30	1	1	7	
Gloves, reusable, latex, pair	30	1	2	3	
Oxygen, 100 l	30	15	1	3	3 days cont. at 1 l/min

Local bacterial infection

Drug or supply	% newborn complications receiving this treatment	Number	Times per day	Days per case	Notes
Local bacterial infection					
Gentian violet, solution	25	1	3	3	NB skin/umbil infection
Ceftriaxone, injection 250 mg	15	1	1	1	Ophthalmia
Syringe, 2 ml, disposable+needle+swab	15	1	1	1	For ceftriaxone IM

Hypoxic ischemic encephalopathy

Drug or supply	% newborn complications receiving this treatment	Number	Times per day	Days per case	Notes
Phenobarbital injection	5	1	1	3	Hypoxic ischemic encephalopathy
Syringe, 2 ml, disposable+needle+swab	5	1	1	3	Hypoxic ischemic encephalopathy (for phenobarbital)

Clinical staff

Management of neonatal complications will require 1 hour of paediatrician time and 2 hours of nurse/midwife time. An auxiliary is assumed to spend about an hour a day caring for the newborn during hospitalization (feeding, changing diapers, administering drugs, etc.)

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Pediatrician	Anesthetist	Lab Technician
Treatment of neonatal complications (h)	7	2	–	–	0.5	–	–

Hospitalization

Except for newborns with local bacterial infection who, in most cases, can be sent home where the mother can administer the necessary drugs and ointments, all other babies with complications need to be hospitalized for 7 days.

	% intervened receiving this treatment	Number	Times per day	Days per case	Notes
Hospital bed (neonatal)	75	1	1	7	

Transportation

No.

Intervention Group 11. Postpartum Care

Scope of intervention

The intervention “Postpartum Care” consists of a check-up visit one week after a woman has given birth, as well as some nutritional supplements, such as iron and vitamin A tablets.

Percentage of women receiving intervention

This number depends very much on the country's policy on postpartum care. The “standard practice” model assumes that postpartum care is equal to antenatal care coverage, which was assumed to be 90%.

From the demography worksheet:

Number of pregnant women

of which:

Percent of women receiving antenatal care..... 90%

of which:

From the direct cost worksheet:

Percent of these women who receive various interventions and treatment lines0-100%

Referral

Postpartum care can be provided equally well at all levels. No referral is necessary

	HEALTH POST	HEALTH CENTRE	HOSPITAL
POSTNATAL CARE	<ul style="list-style-type: none"> • Physical examination • Iron supplementation • Vitamin A supplementation 	Same	Same
LAB TESTS	–	–	–
NUMBER OF VISITS REQUIRED	1	1	1
REFERRAL	–	–	–

Drugs and supplies

HEALTH POST, HEALTH CENTRE, AND HOSPITAL

Nutrition supplements

Drug or supply	% of antenatal care clients receiving this treatment	Number	Times per day	Days per case	Notes
Ferrous salt+folic acid, tablets 60 mg+0.25 mg	100	1	2	15	Iron supplementation
Vitamin A, tablets 200,000 IU					

Clinical staff

A postnatal care visit might last about 15 minutes. At all levels, the same person who is responsible for antenatal care provides the care.

HEALTH POST

	Auxiliary
Postpartum visit (h)	0.25

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Postpartum visit (h)	–	0.25	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Postpartum visit (h)	–	0.25	–	–	–	–	–

Hospitalization

No.

Intervention Group 12. Abortion Complications

Scope of intervention

The intervention “Abortion complications” in this model includes the treatment of all complications related to spontaneous and induced abortions, such as bleeding, infections, etc.

Percentage of women requiring intervention

From the demography worksheet:

All pregnant women

of which

Require management of abortion complications 10%

of which

From the direct cost worksheet:

Require management of shock..... 10%

Require antibiotic treatment 100%

Require uterine evacuation/dilatation and curettage (local anaesthesia) 75%

Require repair of cervical and vaginal lacerations (local anaesthesia) 50%

Require repair of uterine perforations/hysterectomies (laparotomy and general anaesthesia)

..... 10%

Require blood transfusions..... 10%

The incidence of the individual complications depends on the way abortions are managed in a country. If possible, the numbers should be replaced with local estimates.

Clinical management

At the health centre, staff should be able to perform a vacuum aspiration and/or curettage and repair cervical and vaginal tears. Referral to the hospital will be necessary for the repair of uterine perforations and hysterectomies as well as for blood transfusions.

Referral

The model assumes that 100% of all women at the health post will be referred. The health centre will refer the complicated cases (50%).

	HEALTH POST	HEALTH CENTRE	HOSPITAL
TREATMENT	–	<ul style="list-style-type: none"> Give IV fluids Give antibiotics Repair cervical and vaginal tears Evacuate uterus <ol style="list-style-type: none"> Trimester: Vacuum aspiration Trimester: Oxytocics and evacuation/curettage Pain relief 	<ul style="list-style-type: none"> Give IV fluids Oxygen Give antibiotics Give blood transfusion (if Hb <5 g/dl) Repair cervical and vaginal tears Evacuate uterus <ol style="list-style-type: none"> Trimester: Vacuum aspiration Trimester: Oxytocics and evacuation/curettage Repair uterine perforations Perform hysterectomy, if necessary Pain relief
LAB TESTS	–		
NUMBER OF VISITS/ HOSPITAL DAYS REQUIRED	–	2	4
REFERRAL	100% 50% to HC,50% to hospital	50% to hospital	–

HEALTH CENTRE

Treatment of shock/restoration of fluid volume

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Sodium lactate, 500 ml	10	6	1	1	Restoration of fluid balance

Treatment for sepsis

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Ampicillin, 1 g IV	100	1	6	2	Antibiotics (first 2 days IV)
Gentamicin 40 mg/ml, injection 2 ml	100	1	3	2	Antibiotics (first 2 days IV)
Metronidazole, 1 g IV	100	1	2	2	Antibiotics (first 2 days IV)
Doxycycline, tablets 100 mg	100	1	2	10	Follow-up treatment
Tetanus vaccination	50	1	1	1	If uncertainty about vaccination record
Infusion giving set, with needle	100	1	1	1	

Incomplete abortion – uterine evacuation (D&C)

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Diazepam, injection 10 mg	75	1	1	1	Sedation
Pethidine, injection 50 mg	75	1	1	1	Analgesic
Lidocaine, injection 2%	75	1	1	1	Local anaesthetic
Povidone iodine solution 10%	75	1	1	1	Antiseptic
Gloves	75	4	1	1	
Oxytocin, injection 10 IU	75	1	1	1	After evacuation

Repair of cervical and vaginal lacerations

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Diazepam, injection 10 mg	50	1	1	1	Sedation
Pethidine, injection 50 mg	50	1	1	1	Analgesic
Lidocaine, injection 2%	50	1	1	1	Local anaesthetic

Povidone iodine solution 10%	50	1	1	1	Antiseptic
Gloves	50	4	1	1	
Suture, catgut + needle	50	1	1	1	Repair of lacerations

Lab tests

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Haemoglobin test	100	1	1	1	
Blood group test	5	1	1	1	For blood transfusion
Urine test	100	1	1	1	

HOSPITAL**Treatment of shock/restoration of fluid volume**

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Oxygen, 100 l	10	4.5	1	1	1 h at 6-8 l/min (450 l)
Sodium lactate, 500 ml	10	6	1	1	Fluid balance
Blood, one unit	5	2	1	1	If Hb <5 g/dl

Treatment for sepsis

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Ampicillin, 1 g IV	100	1	6	2	Antibiotics (first 2 days IV)
Gentamicin 40 mg/ml, injection 2 ml	100	1	3	2	Antibiotics (first 2 days IV)
Metronidazole, 1 g IV	100	1	2	2	Antibiotics (first 2 days IV)
Doxycycline, tablets 100 mg	100	1	2	10	Follow-up treatment
Tetanus vaccination	50	1	1	1	If uncertainty about vaccination record
Infusion giving set, with needle	100	1	1	1	

Incomplete abortion – uterine evacuation (D&C)

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Diazepam, injection 10 mg	75	1	1	1	Sedation
Pethidine, injection 50 mg	75	1	1	1	Analgesic
Lidocaine, injection 2%	75	1	1	1	Local anaesthetic
Povidone iodine solution 10%	75	1	1	1	Antiseptic
Gloves	75	4	1	1	
Oxytocin, injection 10 IU	75	1	1	1	After evacuation

Repair of cervical and vaginal lacerations

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Diazepam, injection 10 mg	50	1	1	1	Sedation
Pethidine, injection 50 mg	50	1	1	1	Analgesic
Lidocaine, injection 2%	50	1	1	1	Local anaesthetic
Povidone iodine solution 10%	50	1	1	1	Antiseptic
Gloves	50	4	1	1	
Suture, catgut + needle	50	1	1	1	Repair of lacerations

Repair of uterine lacerations/hysterectomies (requiring laparotomy under general anaesthesia)

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Sodium citrate, 0.3 mol/l, 30 ml	10	1	1	1	Antacid
Sodium lactate (Ringer) + set, 500 ml	10	6	1	1	IV fluid
Thiopental, injection 1 g	10	1	1	1	
Suxamthonium 50 mg/ml, injection 2 ml	10	1	1	1	
Catheter, foley	10	1	1	1	To measure urine output
Bag, urine collection, 2000 ml	10	1	1	1	To measure urine output
Halothane gas, 5 ml	10	1	1	1	
Nitrous oxide, 100 l	10	1	1	1	1 h at 2 l/min
Oxygen, 100 l	10	1	1	1	1 h at 1 l/min + pre-oxygenation
Povidone iodine solution 10%	10	1	1	1	Antiseptic
Suture, catgut chromic 0, 150 cm	10	1	1	1	Suture, interior
Suture, catgut chromic 1, 150 cm	10	1	1	1	Suture, interior
Suture, silk, 2 x 0.75 m	10	4	1	1	Suture, exterior
Suture needle, assorted sizes, round body	10	3	1	1	
Oxytocin 10 IU/ml, injection 1 ml	10	2	1	1	
Pethidine 50 mg/ml, injection 1 ml	10	1	1	1	Pain management

Lab tests

Drug or supply	% of abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Haemoglobin test	100	1	1	1	
Blood group test	5	1	1	1	For blood transfusion
Urine test	100	1	1	1	

Clinical staff

It is assumed that it takes a physician 0.5 hours to perform a D&C and/or repair vaginal and cervical lacerations at the health post. At the hospital, surgery will require 0.5-1 hour of obstetrician time (depending on the procedure performed). A laparotomy (for uterine lacerations and ectopic pregnancy ruptures) requires about 1 hour of obstetrician time as well as an hour of anaesthetist and assistant time.

HEALTH POST

Auxiliary
–

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Management of abortion complications (h)	0.5	0.5	0.5	0.25

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Management of abortion complications (h)	1	1	–	1	–	1 (10% of cases)	0.25
Care during recuperation at hospital (h)	1	–	–	–	–	–	–

Hospitalization

At the health centre 50% of all women with abortion-related complications will go home the same day, while 50% will spend the night. At the hospital, 50% of the women will spend 4 days at the hospital.

	% abortion complications receiving this treatment	Number	Times per day	Days per case	Notes
Health centre bed	50	1	1	1	
Hospital bed	50	1	1	4	

Transportation

Emergency transportation will be needed in 10% of the cases.

Family Planning Intervention Groups

Scope of intervention

“Family Planning” as defined in the *Mother-Baby Package* includes **only postpartum**, not general family planning services.

Services provided

Each woman will be provided with a one-year supply of contraceptives. This means 12 pill cycles, 100 condoms or 4 Depo-Provera injections (every 3 months). Norplant, IUD and sterilization will, of course, provide benefits lasting more than one year.

Percentage of women desiring family planning

While the incidence/prevalence of many of the complications for which there exist interventions in the *Mother-Baby Package* is quite universal (obstructed labour, for instance, will occur in about 5% of all deliveries irrespective of the country in which the delivery occurs), this is not the case for family planning. Every country will have a quite different contraceptive prevalence and method mix. The model uses numbers representing a Sub-Saharan Africa setting. These estimates **have to be** replaced with local estimates for the cost calculations to yield any realistic results.

Number of visits required

The number of visits required depends on the contraceptive method chosen. The first visit will always be a counselling session, in which the woman receives counselling on the different contraceptive options that are available to her. Immediately after that or on her second visit she receives the contraceptive of her choice. If she chooses condoms, pills or injections she will have to return every three months to receive a check-up and/or to pick up a new supply or receive another injection. IUD and Norplant users have to come back for one follow-up visit. Sterilization consists of three visits: the counselling, the procedure itself and a follow-up visit.

Method	Number of visits
Pills, condoms and Depo-Provera	4
Norplant, IUD and sterilization	3

Referral

Referral rates depend on the method chosen by the woman and the methods offered at the different facility levels. Any women interested in a method that is not offered at a lower facility level will have to be referred. The referral rates in the model are based on the following assumptions:

AVAILABILITY	HEALTH POST	HEALTH CENTRE	HOSPITAL
CONDOM	X	X	X
ORAL CONTRACEPTIVE (PILL)	X	X	X
DEPO-PROVERA INJECTION		X	X
NORPLANT		X	X
IUD		X	X
STERILIZATION			X

Hospitalization

No.

Transportation

No.

Intervention Group 13. Family Planning—Condom

Percentage of women who choose condoms

The model assumes that 10% of all women choose condoms as their method of postpartum family planning. This number should be replaced with a local estimate.

Number of visits required

Four visits are required in the “standard practice” model: one initial visit in which the woman receives counselling about the family planning methods available to her and in which she receives the first three-month supply of condoms, if that is her choice; three more visits over the year to receive refills.

Referral

No referral is required. Condoms should be available at all facility levels—health post, health centre and hospital.

Drugs and supplies

HEALTH POST, HEALTH CENTRE AND HOSPITAL

Drug or supply	% of condom acceptors receiving this line	Number	Times per day	Number of days	Notes
Condoms	100	1	1	100	One couple-year of protection

Clinical staff time

The model assumes that to supply a woman with a one-year supply of condoms will require 0.5 hours of staff time: 15 minutes for the counselling session, and another 15 minutes for the refills. An auxiliary will provide this service at the health post, and a nurse or midwife will provide it at the health centre and hospital.

HEALTH POST

	Auxiliary
Counselling and refills (h)	0.5

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Counselling and refills (h)	–	0.5	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Counselling and refills (h)	–	0.5	–	–	–	–	–

Intervention Group 14. Family Planning—Depo-Provera

Percentage of women who choose Depo-Provera

The model assumes that 40% of all women choose Depo-Provera as their method of postpartum family planning. This number should, of course, be replaced with a local estimate.

Number of visits required

Four visits are required in the “standard practice” model: one initial visit in which the woman receives counselling about the family planning methods available to her and in which she receives the first injection, if that is her choice; three more visits over the year to receive more injections.

Referral

No referral is required. Depo-Provera should be available at all facility levels—health post, health centre and hospital.

Drugs and supplies

HEALTH POST, HEALTH CENTRE AND HOSPITAL

Drug or supply	% of depo acceptors receiving this treatment	Number	Times per day	Number of days	Notes
Depo-Provera	100	1	1	4	One every 3 months
Syringe, 5 ml + needle	100	1	1	4	For depo injection
Povidone iodine solution	100	1	1	4	Antiseptic
10%					

Clinical staff time

The model assumes that to provide a woman with a one-year supply of Depo-Provera will require 1 hour of staff time: 30 minutes for the counselling session and initial injection, and then 10 minutes for each of the follow-up injections. An auxiliary will provide this service at the health post; a nurse will provide it at the health centre or hospital.

HEALTH POST

	Auxiliary
Counselling and follow-up (h)	1

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Counselling and follow-up (h)	–	1	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Counselling and follow-up (h)	–	1	–	–	–	–	–

Intervention Group 15. Family Planning—IUD

Percentage of women who choose IUDs

The model assumes that 5% of all women choose IUD as their method of postpartum family planning. This number should be replaced with a local estimate.

Number of visits required

Three visits are required in the “standard practice” model. During the initial visit the woman receives counselling about the family planning methods available. In the second visit an IUD is inserted, and the third visit is provided for follow-up.

Referral

Since it is assumed that this method is only available at health centres and hospitals, all women who desire this method at the health post will have to be referred.

Drugs and supplies

HEALTH CENTRE AND HOSPITAL

Drug or supply	% IUD acceptors receiving this treatment	Number	Times per day	Number of days	Notes
IUD	100	1	1	1	
Povidone iodine solution 10%	100	1	1	1	Antiseptic for IUD insertion
Gloves, exam, sterile, disposable	100	1	1	1	For IUD insertion

Clinical staff time

The model assumes that this method will require about 1 hour of staff time. This includes the 15 to 30 minute counselling session, the insertion of the IUD and the follow-up visit. A nurse will provide all these services at the health centre as well as at the hospital.

HEALTH POST

	Auxiliary
Counselling	–

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Counselling, insertion, follow-up (h)	–	1	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Counselling, insertion, follow-up (h)	–	1	–	–	–	–	–

Intervention Group 16. Family Planning—Norplant

Percentage of women who choose Norplant

The model assumes that 1% of all women choose Norplant as their method of postpartum family planning. This number should be replaced with a local estimate.

Number of visits required

Three visits are required in the “standard practice” model: one initial visit in which the woman receives counselling about the family planning methods available; either in that session or during the next visit she will receive the implants; one follow-up visit.

Referral

Since it is assumed that this method is only available at health centres and hospitals, all women who request this method at the health post have to be referred.

Drugs and supplies

HEALTH CENTRE AND HOSPITAL

Drug or supply	% Norplant acceptors receiving this treatment	Number	Times per day	Number of days	Notes
Norplant kit	100	1	1	1	
Lidocaine, injection 1%	100	1	1	1	Local anaesthetic
Povidone iodine solution 10%	100	1	1	1	Antiseptic for Norplant insertion

Clinical staff time

The model assumes that this method will require about 1 hour of staff time. This includes the 15 to 30 minute counselling session, the insertion of the implants and the follow-up visit. A nurse will provide all these services at the health centre as well as at the hospital.

HEALTH POST

	Auxiliary
Counselling	–

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Counselling, insertion, follow-up (h)	–	1	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Counselling, insertion, follow-up (h)	–	1	–	–	–	–	–

Intervention Group 17. Family Planning—Oral Contraceptives

Percentage of women who choose oral contraceptives

The model assumes that 20% of all women choose oral contraceptives as their method of postpartum family planning. This number should be replaced with a local estimate.

Number of visits required

Four visits are required in the “standard practice” model: one initial visit in which the woman receives counselling about the family planning methods available to her and in which she will receive the first three-month supply of pills, if that is her choice; three more visits over the year to receive refills.

Referral

No referral is required. Oral contraceptives should be available at all facility levels—health post, health centre and hospital.

Drugs and supplies

There are three different types of oral contraceptives among which the woman can choose.

HEALTH POST, HEALTH CENTRE AND HOSPITAL

Drug or supply	% oral contraceptive acceptors receiving this treatment	Number	Times per day	Number of days	Notes
Ethinylestradiol+levonorgesterel, cycle	30	1	1	12	
Ethinylestradiol+norethisterone, cycle	30	1	1	12	
Norethisterone, tablets 5 mg	40	1	1	365	Progesterone-only pill

Clinical staff time

The model assumes that to supply a woman with a one-year supply of oral contraceptives requires an hour of staff time: an initial counselling and three refill visits. A nurse will provide this service at the health post and an auxiliary at the health centre and hospital.

HEALTH POST

	Auxiliary
Counselling and refills (h)	1

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Counselling and refills (h)	–	1	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatrician	Anaesthetist	Lab Technician
Counselling and refills (h)	–	1	–	–	–	–	–

Intervention Group 18. Family Planning—Sterilization

Percentage of women who choose sterilization

The model assumes that 20% of all women choose sterilization as their method of postpartum family planning. This number needs to be replaced with a local estimate.

Number of visits required

Three visits are required in the “standard practice” model: one initial visit in which the woman receives counselling about the family planning methods available to her; a second visit in which the procedure is performed and a follow-up visit.

Referral

Sterilization is only available at the hospital. Any woman who desires sterilization has to be referred.

Drugs and supplies

Sterilization will be performed under local anaesthesia.

HOSPITAL

	% sterilization acceptors receiving this treatment	Number	Times per day	Number of days	Notes
Diazepam, injection 10 mg	100		1	1	Sedation
Pethidine, injection 50 mg	100	1	1	1	Analgesic
Lidocaine, injection 2%	100	1	1	1	Local anaesthetic
Povidone iodine solution 10%	100	1	1	1	Antiseptic
Gloves, surgeons	100	1	1	1	
Suture, catgut, chromic No. 0	100	1	1	1	Ligation of tube
Suture, catgut, chromic No. 1	100	1	1	1	Interior suture
Suture, silk	100	1	1	1	Exterior suture
Gauze pad, sterile	100	1	1	1	

Clinical staff

The sterilization procedure will require about 30 minutes of obstetrician time and 30 minutes of auxiliary time. A nurse will be responsible for the counselling (45 minutes) and the follow-up visit (15 minutes).

HEALTH POST

	Auxiliary
Counselling, surgery, follow-up	–

HEALTH CENTRE

	Auxiliary	Nurse/ Midwife	General Physician	Lab Technician
Counselling, surgery, follow-up	–	–	–	–

HOSPITAL

	Auxiliary	Nurse/ Midwife	General Physician	Obstetrician	Paediatricia n	Anaesthetist	Lab Technician
Counselling and follow-up (h)	–	1	–	–	–	–	–
Surgical procedure (h)	0.5	–	–	0.5	–	–	–

Appendix A: Assumptions

Major assumptions of the *Mother-Baby Package Costing Spreadsheet*

- Interventions are based on those described in the *Mother-Baby Package*.
- Reasonable technical efficiency.
- The interventions provided represent reasonable quality of care and are effective.
- Homogeneity of care and services within service levels (i.e. all health centres provide the same type of care).

Specific assumptions

Demography worksheet

- Haemorrhage management in the context of this *Mother-Baby Package* includes post- and intra-partum haemorrhage.
- Abortion management in this context refers to the treatment of any complications from either spontaneous or induced abortions.

Referral worksheet

- Health posts and health centres are not equipped to give blood transfusions, but together they are able to deal with 80-95% of all problems presented there.

Direct cost worksheet treatment assumptions

- Antenatal care every woman receives 4 antenatal visits. Cases seen by the health centre and hospital are assumed to be more complicated. These women receive 5 and 6 visits, respectively.
- Severe anaemia: Women who during their antenatal visits are diagnosed as suffering from severe anaemia will require 2 to 3 additional visits for the successful treatment of this condition.
- Syphilis and gonorrhoea: require 6 visits (two each for the woman, her partner and the baby). 95% of cases can be treated at health post and health centre.
- Normal delivery care: 95% of all cases can be handled at the health centre. The remaining 5% have to be referred to caesarean delivery at the hospital.
- Eclampsia: all cases are referred to the hospital.
- Caesarean delivery is done at the hospital. Seven-day stay at the hospital.
- Minor costs involved with caring for and preparing clients for referral to a higher treatment level are not included in the model, in cases where these are the only costs incurred at the lower level. In developing the model, it was found that including this care led to a considerable increase in the complexity of the model and interpreting the results. It was felt that this did not justify including these relatively minor costs.

Capital and overhead cost worksheets

- Health facilities at the same level have identical staffing needs.
- Staff salaries are the same for similar positions across different facility levels.
- Each staff professional receives the same benefits and training as a proportion of their salary.
- Interest rates have been set to zero. The model assumes that funds needed for capital investment are available interest-free (this assumption will most likely be changed in a future version of the model).

Infrastructure

- Health post, health centre, and hospital worksheet: the complication rates entered onto the demography worksheet remain constant across all three levels of health facilities.
- Fixed costs are allocated to the individual interventions according to percent of total client contacts at that facility level.

Appendix B: Formulae used in the model

DEMOGRAPHY SHEET

Cell	To calculate	Formula	Explanation
C5	Number of births	$CBR/1000 * Population$	Birth rate per 1000 x Population
C6	Number of pregnancies	$Births * 1.1$	Number of births x 110%. Assumes that not all pregnancies are carried to term, i.e., there are 10% more pregnancies than births
F14, G14, H14 (Standard)	Number of health posts (health centres, hospitals) needed to handle the predicted number of client visits	<u>HP</u> : $ROUND(HP_Total_contacts / HP_Avg_Contacts, 0)$ <u>HC</u> : $ROUND(HC_Total_contacts / HC_Avg_Contacts, 0)$ <u>Ho</u> : $ROUND(Ho_Total_contacts / Ho_Avg_Contacts, 0)$	Divides total number of contacts at the health post (HC, Ho) level by number of contacts that can be handled at a single health post (HC, Ho) to arrive at the number of health posts (HC, Ho) that will be necessary to handle the predicted client load. Rounds the result to the nearest integer
F20, G20, H20	Total number of maternal health-related contacts per facility	<u>HP</u> : $HP_Total_maternal_contacts / Number_of_HPs$ <u>HC</u> : $HC_Total_maternal_contacts / Number_of_HCs$ <u>Ho</u> : $Ho_Total_maternal_contacts / Number_of_hospitals$	Total number of visits to the different levels divided by number of facilities at that level
F21, G21, H21	Average maternal health-related contacts per day	<u>HP</u> : $F20/260$ <u>HC</u> : $G20/260$ <u>Ho</u> : $H20/365$	Average number of contacts per year per facility divided by number of working days. Assumption that health posts and health centres are open 5 days a week = 260 days a year, and hospitals are open all year round = 365 days. The number of working days can be changed if necessary
F22, G22, H22	Total number of contacts (maternal health and other)	<u>HP</u> : $HP_Total_maternal_contacts / HP_Percent_maternal$ <u>HC</u> : $HC_Total_maternal_contacts / HC_Percent_maternal$ <u>Ho</u> : $Ho_Total_maternal_contacts / Ho_Percent_maternal$	Calculates the total number of visits by dividing the total number of maternal health-related visits by the proportion of maternal health visits to total visits. Ex. 10,000 maternal visits making up 50% of total visits 10,000 divided by 50% = 20,000
F23, G23, H23 (Current)	Average number of visits per facility <i>per year</i> (maternal health and other)	<u>HP</u> : $HP_Total_contacts / Number_of_HPs$ <u>HC</u> : $HC_Total_contacts / Number_of_HCs$ <u>Ho</u> : $Ho_Total_contacts / Number_of_Hos$	Calculates the average number of contacts per facility per year (same as F20, G20, H20, but for all visits—maternal health and other)
F24, G24, H24	Average number of contacts per day	<u>HP</u> : $F23/260$ <u>HC</u> : $G23/260$ <u>Ho</u> : $H23/365$	Same as F21, G21, H21 for <i>all</i> visits

REFERRAL SHEET

B7:B24 J7:J24 S7:S24	Number of clients originally seeking care at the health post (health centre, hospital) level	Clients_Abortion_complications*First_contact_HP Clients_Anaemia*First_contact_HP etc.	Calculates the number of women who will originally seek care at the health post level (this does not mean they will receive treatment there). Uses total number of clients for the different interventions as calculated in Column E, rows 30 through 47, and multiplies these numbers with the percentages that seek care at the HP, HC and hospital level, respectively. The user should have entered the percentage on the demography sheet in cells F15, G15 and H15
E7:E24	Percent of women who actually receive treatment at the HP level	1-C7-D7 1-C8-D8	Calculates the percentage of women who actually receive treatment at the health post level by subtracting from 100% the percentages that are referred to health centre or hospital for treatment
F7:F24 O7:O24	Number of women actually treated at the health post (HC) level	ROUND(B7*E7,0) ROUND(B8*E8,0) etc.	Multiplies the number of women who originally seek care with the percentage of women who actually receive treatment at this level. The obtained number is rounded to the nearest integer in order to avoid obtaining fractions of clients
U7:U24	Number of women actually treated at the hospital level	ROUND(S7+T7,0) ROUND(S8+T8,0) etc.	Compare to F7:F24 (for health posts) and O7:O24 (for health centres). It is assumed that there is no further referral from the hospital and that every woman who comes there is treated (% Actually treated = 100%). The formula therefore only adds up all women who originally seek care at the hospital and all women who are referred from a lower level in the health system (HP or HC)
G7:G24	Total number of contacts	F7*G7 F8*G8 etc.	Total number of women receiving treatment multiplied by the number of contacts/visits to provide effective treatment. While at the health post and the health centre these contacts are usually outpatient visits, at the hospital they can be either outpatient visits (for some interventions such as antenatal care) or inpatient hospital days (for haemorrhage and caesarean deliveries)
B49:D49	Percent of total clients	B48/Total_clients C48/Total_clients etc.	Of all the clients what percentage actually receive treatment at the health post (HC, Ho)?
S49:U49	Percent of total client contacts	S48/Total_contacts T48/Total_contacts etc.	Of all the visits to the district's health system, what percentage of visits is to the health post (HC, Ho)?

CAPITAL COST

D6,G6,J6	Cost of furniture and beds	D5*10% G5*10% J5*10%	Furniture and beds are calculated as 10% of the cost of the building
F5-F11	Annualized capital cost at health post	D5*E5/\$B5 D6*D6/\$B6	Construction/purchase price times share used for maternal interventions divided by years of useful life (amortization period) <u>Ex.</u> A health post building with a construction cost of \$10,000 is used to 50% for maternal health services. It has a useful life of 20 years. The formula in this case would be: 50% of \$10,000 divided by 20 years = \$250
I5-I11	Annualized capital cost at health centre	G5*H5/\$B5	See D5-D11
L5-L11	Annualized capital cost at hospital	J5*K5/\$B5	See D5-D11

OVERHEAD COST

C5, C6 (HP) F5, F6 (HC) I5, I6 (Ho)	Value of facilities and equipment	SUM('Capital Cost'!D5:D9)	Building maintenance cost and utilities are calculated as a percentage of the new cost of building and equipment. Therefore, this cell adds up all the items on the capital costs sheet that are relevant for this calculation (note that emergency vehicles—cell D10—are excluded)
C7, F7, I7	Value of emergency vehicles	'Capital Cost'!D10	Emergency vehicle maintenance is calculated as a percentage of the new cost of emergency vehicles.
E5, H5, K5	Building maintenance costs	C5*D5*\$B5	Value of facilities and equipment x % of these that are used for maternal and neonatal interventions x 2% (maintenance as % of new value)
E6, H6, K6	Utilities cost	C6*D6*\$B6	Value of facilities and equipment x % of these that are used for maternal and neonatal interventions x 1% (utilities as % of new value)
E7, H7, K7	Vehicle maintenance cost	C7*D7*\$76	Value of emergency vehicles x % that are used for maternal and neonatal interventions x 10% (maintenance as % of new value)
E16:E24 (HP) H16:H24 (HC) K16:K24 (Ho)	Support staff costs	C16*D16*\$B16 C17*D17*\$B17 etc.	Required FTE (full-time employees) per facility x share of maternal visits at facility x salary+benefits for that type of employee

DIRECT COST

Column B	Input category	User input	B - Blood supplies D - Drugs H - Hospital bed/hotel cost L - Laboratory supplies P - Personnel cost S - Disposable supplies T - Emergency transport (petrol costs) V - Vaccines
Columns D,E,F	Percent of intervened receiving this treatment at health post/health centre/hospital	User input	Of all patients requiring treatment of that condition, what percentage receives this type of treatment? (For instance, of all anaemia patients 70% will receive iron pills but only 5% will receive a blood transfusion)
Column H	Number	User input	Drugs: How many pills have to be taken at one time? Personnel cost: How many hours of, for instance, a nurse's time does the treatment take?
Column I	Times per day	User input	How many times a day does the drug have to be taken, does a nurse have to spend time with the patient, etc?
Column J	Days per case/episode	User input	For how many days will the patient have to take a drug, for how many days will a nurse have to care for the patient?
Column K	Treatment units per case/episode	H7*I7*J7	Number of units x Times per day x Days per case/episode. Calculates how many of an item will be needed to treat the condition
Column L	Unit cost	VLOOKUP(C7,Drug_Prices,8)	VLOOKUP Formula: 1. Goes across row to Column C to find name of drug 2. Goes to Drug_Prices table on Drug List sheet (A7:H150) 3. Finds name of drug in Drug_Prices table, then goes across row to Column 8 (Unit Cost) to find unit cost
Column M	Cost per case or episode	K7*L7	Treatment units per case/episode x Cost per unit
Column N	Average cost per client at health post	M7*D7	Cost per case/episode x Percent of all patients with complication X receiving this drug/treatment at health post
Column O	Average cost per client at health centre	M7*E7	
Column P	Average cost per client at hospital	M7*F7	
Columns Q,R,S	Foreign exchange requirements	=IF(VLOOKUP(C7,Drug_Prices,6) = "x",N5,0)	Checks whether Column 7 (Drug to be paid in US\$) of Drug_Prices area contains an "x" (meaning that the drug has to be paid for in foreign currency). If this is the case it puts the contents of N5 (Average cost per client at health post) into the cell. If not, it puts zero.

SALARIES

C40:C60	In-service training	10%*C40 10%*C41 etc.	In-Service training calculated as costing 10% of annual salary (can be changed)
G40:G60	Salary per hour	D40/E40/F40 etc.	Salary per year divided by hours worked per year
B77:S83 (HP) B86:S92 (HC) B95:S101 (Ho)	Total staff time requirements for the different interventions (HP, HC and Ho)	B9*B\$69 B10*B\$69 etc.	Multiplies the time required for one intervention by the total number of clients who require this intervention. Ex. One gonorrhoea intervention takes 30 minutes of a nurse's time at a health centre. There are 200 gonorrhoea patients at the health post Formula: 0.5 h x 200 clients = 100 h
B106:B131	Total hours required per staff type	SUM(B77:S77) SUM(B83:S83)	Sums the time requirements across all the interventions
D106:D131	Total number of staff required at that level of the health system (health post, health centre or hospital)	B107/C107	Divides hours of medical staff time required by the number of hours one staff usually works in a year
E106 – E131	Number of staff required <i>per facility</i>	D84/Number_of_HPs	Divides number of staff required at that level by the number of facilities at that level

HEALTH POST/HEALTH CENTRE/HOSPITAL

A7:I25	Direct cost - per client	Pivot table	Adds up all the inputs listed on the direct cost sheet for the different interventions and input categories (D all drugs, P all personnel costs, etc.)
A29:I48	Total direct cost - total,	B8*Referral!\$B30 B9*Referral!\$B31 etc.	Direct cost per client x number of clients for each intervention as calculated on the referral sheet
O30:O47	Overhead costs allocated to the individual interventions	\$R\$11*M30 \$R\$11*M31 etc.	Total overhead costs for all facilities are allocated to the individual interventions according to the interventions' share in the total number of visits to that facility level
Q30:Q47	Capital costs allocated to the individual interventions	\$R\$24*M30	Total capital costs are allocated to the individual interventions using the same allocation factor as overhead costs

Appendix C: National estimates of coverage of maternity care

	Antenatal care (%)	Skilled attendant at delivery (%) (doctor, nurse or midwife)	Deliveries in health facilities (%)
AFRICA			
Algeria	58	77	76
Angola	25	17	16
Benin	60	38	20
Botswana	92	77	66
Burkina Faso	59	43	43
Burundi	88	24	20
Cameroon	73	58	62
Cape Verde	99	n.a.	n.a.
Central African Republic	67	46	50
Chad	30	15	15
Comoros	69	24	20
Congo	55	50	n.a.
Côte d'Ivoire	83	45	45
Democratic Republic of the Congo	66	n.a.	n.a.
Djibouti	76	79	75
Egypt	53	46	27
Equatorial Guinea	37	5	5
Eritrea	19	6	5
Ethiopia	20	8	8
Gabon	86	80	79
Gambia	91	44	n.a.
Ghana	86	44	42
Guinea	59	31	25
Guinea-Bissau	50	n.a.	n.a.
Kenya	95	45	44
Lesotho	91	50	50
Liberia	83	58	n.a.
Libyan Arab Jamahiriya	100	76	n.a.
Madagascar	78	57	45
Malawi	90	55	55
Mali	25	24	24
Mauritania	49	40	40
Mauritius	99	97	95
Morocco	45	40	37
Mozambique	54	30	27
Namibia	88	68	67
Niger	30	15	16
Nigeria	60	31	31
Réunion	95	97	96
Rwanda	94	26	25
Senegal	74	47	47
Sierra Leone	30	25	20
Somalia	40	2	2
South Africa	89	82	79
Sudan	54	86	18
Swaziland	70	56	56
Togo	43	32	8
Tunisia	71	90	86
Uganda	87	38	30
United Republic of Tanzania	92	44	53

	Antenatal care (%)	Skilled attendant at delivery (%) (doctor, nurse or midwife)	Deliveries in health facilities (%)
Zambia	92	51	51
Zimbabwe	93	69	69
ASIA			
Afghanistan	8	8	5
Armenia	95	95	95
Azerbaijan	95	95	95
Bahrain	96	94	97
Bangladesh	23	14	5
Bhutan	51	12	11
Brunei Darussalam	100	98	98
Cambodia	52	21	7
China	79	85	51
Cyprus	100	98	98
Democratic People's Republic of Korea	100	100	100
East Timor	n.a.	n.a.	n.a.
Georgia	95	95	95
Hong Kong	100	100	100
India	62	35	26
Indonesia	82	36	18
Iran	62	74	65
Iraq	59	54	49
Israel	90	99	99
Jordan	80	87	78
Kazakhstan	92	99	95
Kuwait	99	99	97
Kyrgyzstan	90	95	95
Lao People's Democratic Republic	25	30	7
Lebanon	85	45	n.a.
Malaysia	90	98	90
Maldives	95	90	n.a.
Mongolia	90	97	97
Myanmar	80	52	n.a.
Nepal	15	8	6
Oman	98	92	82
Pakistan	27	18	13
Philippines	83	53	28
Qatar	100	97	87
Republic of Korea	96	95	99
Saudi Arabia	87	90	86
Singapore	100	100	99
Sri Lanka	100	94	94
Syrian Arab Republic	33	67	37
Tajikistan	90	92	92
Thailand	77	71	n.a.
Turkey	62	76	60
Turkmenistan	90	90	90
United Arab Emirates	95	96	95
Uzbekistan	90	90	90
Viet Nam	78	79	70
Yemen	26	16	12
LATIN AMERICA AND THE CARIBBEAN			
Argentina	n.a.	96	90
Bahamas	100	100	99
Barbados	98	98	98
Belize	96	77	76

	Antenatal care (%)	Skilled attendant at delivery (%) (doctor, nurse or midwife)	Deliveries in health facilities (%)
Bolivia	52	46	42
Brazil	74	73	81
Chile	91	98	98
Colombia	83	85	77
Costa Rica	95	97	98
Cuba	100	99	99
Dominican Republic	97	90	92
Ecuador	75	64	64
El Salvador	69	87	51
Guatemala	53	35	23
Guyana	95	93	90
Haiti	68	20	20
Honduras	73	47	45
Jamaica	98	92	79
Mexico	71	69	63
Netherlands Antilles	95	95	95
Nicaragua	71	61	59
Panama	72	84	84
Paraguay	83	66	55
Peru	64	53	46
Puerto Rico	99	99	99
Surinam	100	91	n.a.
Trinidad and Tobago	98	98	96
Uruguay	80	96	96
Venezuela	74	97	97
Source: WHO. <i>Coverage of maternity care: a listing of available information</i> . Geneva, World Health Organization, 1996 (WHO/RHT/MSM/96.28).			

Appendix D: Contraceptive prevalence data, 1994

	Any method (%)	Modern methods (%)	Method mix (all modern methods = 100%)					
			Sterilization	Pill	Injectable	IUD	Condom	Other
AFRICA								
Algeria	46.7	42.9	3	90	0	6	1	0
Angola	n.a.							
Benin	9.2	0.5	0	40	0	20	20	20
Botswana	33.0	31.7	14	47	17	18	4	1
Burkina Faso	7.9	4.1	7	51	2	17	20	2
Burundi	8.7	1.2	8	17	42	25	8	0
Cameroon	16.1	4.3	28	28	9	7	21	7
Cape Verde	n.a.							
Central African Republic	15.0							
Chad	n.a.							
Comoros	21.0							
Congo	n.a.							
Côte d'Ivoire	2.9	0.5	0	80	0	20	0	0
Democratic Republic of the Congo	7.7	2.0	10	20	20	5	25	20
Djibouti	n.a.							
Egypt	46.2	44.8	2	29	1	62	4	1
Equatorial Guinea	n.a.							
Eritrea	5.0							
Ethiopia	4.3	2.6	8	77	0	12	4	0
Gabon	n.a.							
Gambia	11.8	6.7	6	49	25	13	6	0
Ghana	12.9	5.2	19	35	6	10	6	25
Guinea	2.0							
Guinea-Bissau	n.a.							
Kenya	32.7	27.3	20	35	26	15	3	0
Lesotho	5.3	2.4	33	50	8	4	4	0
Liberia	6.4	5.5	20	60	5	11	0	4
Libyan Arab Jamahiriya	n.a.							
Madagascar	16.7	5.1	18	28	32	10	10	2
Malawi	13.0	7.4	23	30	20	4	22	1
Mali	4.7	1.3	8	69	8	8	0	8
Mauritania	3.3	1.2	8	42	8	25	8	8
Mauritius	74.7	48.9	15	43	8	6	27	1
Morocco	41.5	35.5	8	79	0	9	3	1
Mozambique	n.a.							
Namibia	28.9	26.0	28	32	30	8	1	1
Niger	4.4	2.2	5	68	18	9	0	0
Nigeria	6.0	3.5	9	34	20	23	11	3
Réunion	66.6	61.7	5	65	2	23	4	0
Rwanda	21.2	12.8	5	23	68	2	2	0
Senegal	7.4	4.7	9	47	4	30	9	2
Sierra Leone	n.a.							
Somalia	n.a.							
South Africa	49.7	48.4	17	27	40	11	1	3
Sudan	8.7	5.6	14	70	2	13	2	0
Swaziland	19.9	17.2	18	33	33	10	4	2
Togo	12.1	3.0	20	13	7	27	13	20
Tunisia	49.8	40.4	28	22	2	42	3	2
Uganda	4.9	2.5	32	44	16	8	0	0

	Any method (%)	Modern methods (%)	Method mix (all modern methods = 100%)					
			Sterilization	Pill	Injectable	IUD	Condom	Other
United Republic of Tanzania	10.4	6.5	25	52	6	6	11	0
Zambia	15.2	8.9	24	48	1	6	20	1
Zimbabwe	43.1	36.1	6	86	1	3	3	1
ASIA								
Afghanistan	1.6	1.6	0	63	0	25	13	0
Armenia	n.a.							
Azerbaijan	n.a.							
Bahrain	53.4	30.3	23	43	0	6	27	0
Bangladesh	45.1	36.7	22	48	12	6	8	3
Bhutan	n.a.							
Brunei Darussalam	n.a.							
Cambodia	n.a.							
China	83.0	80.0	43	2	2	41	0	13
Cyprus	n.a.							
Democratic People's Republic of Korea	62.0							
East Timor	n.a.							
Georgia	n.a.							
Hong Kong	80.8	75.0	31	22	3	6	35	4
India	43.0	38.0	78	0	5	14	0	3
Indonesia	49.7	47.1	6	31	31	28	2	1
Iran	64.6	44.6	17	51	0	16	14	2
Iraq	13.7	10.4	13	45	5	27	10	0
Israel	n.a.							
Jordan	35.0	26.9	21	17	0	57	3	2
Kazakhstan	35.0							
Kuwait	34.6	31.7	6	76	0	12	5	2
Kyrgyzstan	n.a.							
Lao People's Democratic Republic	19.0							
Lebanon	53.0	23.0	4	61	0	4	30	0
Malaysia	48.3	31.4	22	46	3	11	18	0
Maldives	n.a.							
Mongolia	61.0							
Myanmar	17.0							
Nepal	22.7	21.8	50	5	11	1	3	31
Oman	8.6	7.5	29	32	4	20	15	0
Pakistan	11.8	9.0	39	8	9	14	30	0
Philippines	40.0	24.9	48	34	0	12	4	2
Qatar	32.3	28.9	16	45	0	30	8	2
Republic of Korea	79.4	69.5	51	4	0	13	15	17
Saudi Arabia	n.a.							
Singapore	71.3	62.8	33	27	0	5	33	1
Sri Lanka	54.9	30.4	56	9	5	8	11	12
Syrian Arab Republic	67.5	65.5	34	31	14	11	2	8
Tajikistan	n.a.							
Thailand	67.5	65.5	34	31	14	11	2	8
Turkey	62.6	34.5	8	14	0	54	19	3
Turkmenistan	n.a.							
United Arab Emirates	n.a.							
Uzbekistan	n.a.							
Viet Nam	53.2	35.3	7	1	0	88	3	1
Yemen	7.2	6.1	13	52	10	20	2	2
LATIN AMERICA AND THE CARIBBEAN								
Bahamas	61.7	60.1	27	52	8	6	4	2
Barbados	55.0	53.2	20	49	2	10	14	6

	Any method (%)	Modern methods (%)	Method mix (all modern methods = 100%)					
			Sterilization	Pill	Injectable	IUD	Condom	Other
Belize	46.9	41.8	20	18	5	2	2	53
Bolivia	30.3	12.2	11	5	2	12	1	70
Brazil	65.8	56.7	31	29	1	1	2	36
Chile	n.a.							
Colombia	66.1	54.7	38	26	4	23	5	4
Costa Rica	75.0	64.6	23	21	1	10	18	27
Cuba	70.0	67.0	33	15	0	49	3	0
Dominican Republic	56.4	51.7	74	19	0	3	2	1
Ecuador	52.9	41.5	44	21	1	29	3	2
El Salvador	53.3	48.4	34	9	4	2	2	48
Guatemala	23.2	19.1	13	5	1	2	1	78
Guyana	31.4	28.3	30	32	1	20	10	7
Haiti	6.7	5.0	26	46	16	8	4	0
Honduras	46.7	34.7	21	14	1	7	4	54
Jamaica	62.0	57.0	21	37	11	2	30	0
Mexico	52.7	44.6	22	12	3	12	2	49
Netherlands Antilles	n.a.							
Nicaragua	48.7	44.9	20	14	1	10	3	52
Panama	58.2	54.2	35	13	1	6	2	43
Paraguay	48.4	35.3	21	39	15	16	7	2
Peru	59.0	32.8	24	17	6	41	9	3
Puerto Rico	70.4	62.1	44	10	0	5	5	36
Surinam	n.a.							
Trinidad and Tobago	52.7	44.4	10	17	1	5	14	53
Uruguay	n.a.							
Venezuela	49.3	37.7	20	41	1	23	13	3

Source: United Nations, Department for Economic and Social Information and Policy Analysis, Population Division. *Levels and trends of contraceptive use as assessed in 1994*. New York, United Nations, 1996.

Appendix E: Equipment List for *Mother-Baby Package*

Equipment	Supplier	Stock number	1996/97 price
Apron, utility, plastic 90x100 cm	UNICEF	30 500 00	\$2.30
Basin stands, double bowl, swivel castors	UNICEF	01 515 01	\$98.26
Basin stands, single bowl, swivel castors	UNICEF	01 510 01	\$56.16
Basin, utility, 4 l, stainless steel	UNICEF	02 160 00	\$4.90
Beds, labour and delivery	UNICEF	01 010 00	\$538.28
Bowl, (sponge), stainless steel, small, 600 ml	UNICEF	02 250 00	\$1.99
Bowl, stainless steel, large, 1200 ml	UNICEF	02 254 00	\$2.75
Bowl, stainless steel, medium			
Brush, surgeon's hand	UNICEF	05 140 00	\$0.55
Bucket with cover, stainless steel, 12 l	UNICEF	02 638 00	\$20.26
Catheters, urethral, Ch. 12, nelaton	UNICEF	03 220 00	\$1.17
Clamps, crushing, large			
Clamps, crushing, small			
Clamps, occlusion, curved			
Clamps, occlusion, straight			
Clock, battery-operated wall	UNICEF	44 172 10	\$6.30
Cranial perforator (Simpson)	UNICEF	07 597 00	\$16.92
Cup, 180 ml, stainless steel (Gallipot)	UNICEF	02 370 00	\$1.00
Curettes, uterine, blunt	UNICEF	07 130 00	\$2.83
Curettes, uterine, sharp	UNICEF	07 143 00	\$2.86
Diathermy electrode			
Diathermy machine			
Dilators, uterine, double-ended (Hegar), set of 5	UNICEF	07 182 00	\$15.89
Dish, glass, for tissue inspection			
Face masks, infant size to adult size	UNICEF	07 470 00	
Flashlight, with batteries	UNICEF	06 290 00	\$8.62
Forceps, artery, large, curved (hysterectomy forceps)	UNICEF	07 285 00	\$3.34
Forceps, artery, large, straight (Pean), 22 cm	UNICEF	07 280 00	\$3.14
Forceps, artery, small, curved, 14 cm (Kelly)	UNICEF	07 240 00	\$2.01
Forceps, artery, small, straight, 14 cm (Kelly)	UNICEF	07 245 00	\$1.95
Forceps, dissecting, non-toothed, 15 cm	UNICEF	07 210 00	\$1.13
Forceps, dissecting, non-toothed, 25 cm	UNICEF	07 222 00	\$2.57
Forceps, dissecting, toothed	UNICEF	07 375 00	\$1.53
Forceps, Mosquito, 12.5 cm, straight	UNICEF	07 305 00	\$1.91
Forceps, obstetric	UNICEF	07 335 00	\$33.51
Forceps, ovum (de Lee), 24 cm			
Forceps, sponge	UNICEF	07 350 00	\$3.36
Forceps, sterilizer (Cheatle), 270 mm	UNICEF	07 352 00	\$5.75
Forceps, sterilizer (Vaughn), 200 mm	UNICEF	07 360 01	\$2.21
Forceps, tenaculum, single tooth, Duplay, 28 cm	UNICEF	07 400 00	\$3.91
Forceps, tissue (Allis)	UNICEF	07 380 00	\$2.63
Forceps, tissue (Babcock)	UNICEF	07 365 00	\$3.53
Forceps, tissue (Duval)	UNICEF	07 391 00	\$8.09
Forceps, vulsellum, curved, Museux, 24 cm	UNICEF	07 424 00	\$4.23
Funnels, stainless steel, 90 ml	UNICEF	02 400 00	\$6.70
Heat source for sick neonate	Estimate		\$20.00
Infusion stand, variable height	UNICEF	00 150 00	\$72.70
Instrument stands (Mayo), with tray	UNICEF	01 865 01	\$102.30
Instrument sterilizer	UNICEF	01 600 00	\$33.48
Instrument trays, covered, 22.5x12.5x5 cm	UNICEF	02 700 00	\$5.96
Instrument trays, covered, 31x19.5x6.3 cm	UNICEF	02 765 00	\$8.51
Instrument trolleys	UNICEF	01 870 04	\$181.21

Equipment	Supplier	Stock number	1996/97 price
Instrument/catheter trays, covered	UNICEF	02 770 00	\$15.95
Instrument/dressing trays, shallow, 37x27 cm	UNICEF	02 785 00	\$6.70
Instrument/dressing trays, shallow, 48x33 cm	UNICEF	02 780 00	\$8.91
Irrigator, 1.5 l, with tubing ,clamp, connector	UNICEF	02 520 00	\$9.85
Jar, forceps, 18 cm, autoclavable	UNICEF	03 335 00	\$7.96
Jugs, stainless steel, 3 l			
Jugs, stainless steel, 4 l			\$4.90
Kidney dish, large, 825 ml	UNICEF	02 110 00	\$2.19
Kidney dish, medium			
Kidney dish, small, 475 ml	UNICEF	02 100 00	\$2.03
Laryngoscope, with spare bulb and batteries	UNICEF	07 467 04	\$75.49
Laryngoscope, batteries	UNICEF	18 022 16	\$3.50
Laryngoscope, battery recharger	UNICEF	18 022 19	\$6.84
Measures, graduated, stainless steel, 500 ml	UNICEF	02 600 00	\$2.28
Needle holder, long	UNICEF	07 436 00	\$3.07
Needle holder, short	UNICEF	07 429 70	\$2.17
Operating-room lights, portable	UNICEF	01 193 00	\$411.09
Operating stool, revolving	UNICEF	01 690 00	\$75.09
Operating table	UNICEF	01 881 00	\$1,334.81
Oropharyngeal airways, sizes 00 to 05	UNICEF	07 009 00	\$3.82
Oxygen cylinder, refillable, 2 l	UNICEF	00 020 45	\$250.00
Oxygen cylinder regulator	UNICEF	00 020 46	\$310.00
Probe, flexible, with round point	UNICEF	07 598 00	\$0.45
Probe, grooved	UNICEF	07 598 10	\$0.66
Pump, suction, foot-operated	UNICEF	07 606 40	\$206.33
Pump, surgical suction, 220 V, with tubing	UNICEF	07 606 35	\$241.38
Radiograph viewing boxes			
Razor blades	UNICEF	05 442 00	\$0.05
Receptacles, "kick about", on frames with roller casters			
Resuscitation set, infant, manual	UNICEF	08 450 00	\$172.56
Resuscitation set, infant, with face mask, oxygen cylinder etc	UNICEF	00 020 44	\$1,681.20
Retractor (Deaver), medium, 75 mm blade			
Retractor (Deaver), narrow, 25 mm			
Retractor (Richardson), double-ended	UNICEF	07 677 50	\$3.52
Retractor, Rake (Volkman), 4 prong	UNICEF	07 690 00	\$3.70
Retractor, self-retaining	UNICEF	07 675 00	\$32.55
Retractors (Langenbeck), medium, 9.5 mm	UNICEF	07 689 40	\$4.31
Retractors (Langenbeck), narrow, 6 mm	UNICEF	07 689 00	\$3.55
Retractors, malleable copper (spatulae)	UNICEF		
Ruler, stainless steel	UNICEF		
Scale, infant	UNICEF	01 455 00	\$32.97
Scales, laboratory, 2 kg capacity	UNICEF	09 049 90	\$214.86
Scalpel handle	UNICEF	07 450 00	\$1.87
Scissors, blunt-ended, stitch removal	UNICEF	07 745 00	\$1.78
Scissors, dissecting, curved, (Mayo) 17 cm	UNICEF	07 706 00	\$2.94
Scissors, dissecting, curved, (Mayo) 23 cm	UNICEF	07 708 00	\$3.45
Scissors, dissecting, curved, (Metzenbaum) 14.5 cm	UNICEF	07 712 50	\$1.94
Scissors, dissecting, straight, (Mayo) 17 cm	UNICEF	07 712 00	\$2.69
Scissors, episiotomy	UNICEF	07 715 00	\$2.24
Scissors, heavy-duty, "counter"	UNICEF	07 720 00	\$3.53

Equipment	Supplier	Stock Number	1996/97 Price
Sheeting, rubber, double coated, 91cm wide	UNICEF	03 600 00	\$5.98
Speculum, bivalve, large (Graves)	UNICEF	07 780 00	\$4.24
Speculum, bivalve, medium (Graves)	UNICEF	07 775 00	\$3.96
Speculum, bivalve, small (Graves)	UNICEF	07 777 00	\$3.86
Speculum, vaginal, large (Sims)	UNICEF	07 790 00	\$2.95
Sphygmomanometer, aneroid, with cuff	UNICEF	06 830 00	\$22.64
Stands for swabs	UNICEF		
Sterilizer (Autoclave), electric, with horizontal drum	UNICEF	01 540 00	\$432.56
Sterilizer, for boiling instruments, fuel	UNICEF	01 600 00	\$33.48
Sterilizer, for dressings, fuel-heated, 39l	UNICEF	01 560 00	\$275.75
Sterilizing drums, 24cm diameter	UNICEF	01 077 00	\$17.63
Sterilizing drums, 29cm diameter	UNICEF	01 080 00	\$20.25
Sterilizing drums, 34cm diameter	UNICEF	01 090 00	\$21.99
Stethoscope, binaural	UNICEF	06 860 00	\$33.64
Stethoscope, fetal	UNICEF	00 685 00	\$1.22
Stove, kerosene, single burner	UNICEF	01 700 00	\$33.48
Strainer, plastic	UNICEF		
Stretcher, folding	UNICEF	01 800 00	\$100.29
Stretchers with combination wheel and adjustable sides	UNICEF	01 810 04	\$353.56
Syringe, glass, irrigating, 100 ml	UNICEF		
Syringe, metal, irrigating (Kramer), 90 ml	UNICEF	07 830 00	\$21.60
Tape measure, 1.5m	UNICEF	06 900 00	\$2.56
Thermometer	UNICEF	04 810 52	\$0.65
Tonometer, Shiötz	UNICEF		
Tourniquet, latex rubber, 75cm	UNICEF	03 850 00	\$0.59
Towel clips	UNICEF	07 119 00	\$1.02
Towels	UNICEF	05 750 00	\$0.23
Trocar with plunger	UNICEF		
Tube, drainage	UNICEF		
Tube, endotracheal, 40cm, reusable	UNICEF	03 195 00	\$1.88
Tube, rectal, rubber, 20 Ch., 50cm	UNICEF	03 780 00	\$4.42
Tube, rectal, rubber, 24 Ch., 50cm	UNICEF	03 790 00	\$4.34
Tube, stomach, 24 Ch., 150cm long	UNICEF	03 800 00	\$13.20
Tweezers	UNICEF	07 207 00	\$0.67
Urine specimen bottle, PPE, 10ml	UNICEF	09 211 00	\$0.10
Uterine sound (Simpson)	UNICEF	07 752 00	\$1.22
UV light source	UNICEF		
Vacuum aspirator, manual, with tubing etc.	UNICEF	07 915 00	\$530.64
Vacuum syringes	UNICEF		
Ventilator bag	UNICEF	08 450 00	\$172.56
Water dispensers, hot and cold, sterile distilled water	UNICEF		

Bibliography

Cowley P, Bobadilla J-L. *Estimating the costs of the Mother-Baby Package of health interventions*. Geneva, World Health Organization, 1995 (unpublished paper).

Creese A, Parker D, eds. *Cost analysis in primary health care*. Geneva, World Health Organization, 1994.

International Dispensary Association. *IDA price indicator March 1999*. Amsterdam, International Dispensary Association, 1999.

Jamison D et al., eds. *Disease control priorities in developing countries*. New York, Oxford University Press, 1993.

Management Sciences for Health (MSH) and The World Bank. *International drug price indicator guide, 1998*. Arlington, VA, Management Sciences for Health, and Washington, DC, The World Bank, 1998.

Microsoft Corporation. *Microsoft Excel, version 5.0*. Redmond, WA, USA, Microsoft Corporation, 1993.

UNICEF. *UNICEF supply catalogue*. Copenhagen, UNICEF Supply Division, 1997.

UNICEF. *Essential drugs indicative price list July-September 1998*. Copenhagen, UNICEF Supply Division, 1998.

United Nations, Department for Economic and Social Information and Policy Analysis, Population Division. *Levels and trends of contraceptive use as assessed in 1994*. New York, United Nations, 1996.

Westoff CF, Bankole A. *DHS comparative studies No. 16: Unmet need: 1990-1994*. Calverton, MD, Macro International, Inc., 1995.

WHO. *Coverage of maternity care: A listing of available information*. Geneva, World Health Organization, 1996 (WHO/RHT/MSM/96.28).

WHO. *Hypertensive disorders of pregnancy*. Geneva, World Health Organization, 1991 (WHO/MCH/91.4).

WHO. *Maternal and perinatal infections: A practical guide*. Geneva, World Health Organization, 1991 (WHO/MCH/91.10).

WHO. *Maternal mortality ratios and rates: A tabulation of available information, 3rd ed.* Geneva, World Health Organization, 1991 (WHO/MCH/MSM/91.6).

WHO. *Mother-Baby Package: Implementing safe motherhood in countries*. Geneva, World Health Organization, 1994 (WHO/FHE/MSM/94.11).

WHO. *Prevalence of anaemia in women: A tabulation of available information*. Geneva, World Health Organization, 1992 (WHO/MCH/MSM/92.2).

WHO. *Unsafe abortion: Global and regional estimates of incidence of and mortality due to unsafe abortion, with a listing of available country data*. Geneva, World Health Organization, 1998 (WHO/RHT/MSM/97.16).