Assessment of Commodity Needs for Integrated Reproductive Health in Zambia

Applying the Cost-Estimate Strategy

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June 2000

Rational Pharmaceutical Management Project
C.A. No. HRN-A-00-92-0059-13

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Strategic Objective # 1

This publication was made possible through support provided by the U.S. Agency for International Development, under the terms of cooperative agreement number HRN-A-00-92-0059-13. Any opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the U.S. Agency for International Development.

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Acknowledgements

Special thanks are extended to the Central Board of Health, Government of Zambia, the U.S. Agency for International Development in Zambia, to Ms. Jane-Meya Nyirenda, Ms. Peggy Fulilwa (CBOH), the "CES team," and CES data collectors. Special thanks go to Delia Banda, Mbita Sumbwe, Genevieve Mwale, Noleen Kalamatila, Rose Andala, Peggy Chibuye, Patricia Stephenson, and many others without whom this report would not have been possible. Special thanks go to RPM staff for their technical assistance and editorial support, including Inga Adams, Robert Burn, Julie McFadyen, Douglas Keene, Wendy Osborne, and Kara Suter. This study could not have been conducted successfully without the committed work and valuable insights provided by these people.

Acronyms

ANC	antenatal care
C-section	Caesarian section
CBOH	Central Board of Health
CES	Cost-Estimate Strategy
CYP	couple years protected
DILSAT	District Integrated Logistics Self-Assessment Tool
EDL	Essential Drugs List
FP	family planning
GP	general practitioner
GUD	genital urinary disease
HMIS	health management information system
IRH	integrated reproductive health
IUD	intrauterine device
IV	intravenous
MOH	Ministry of Health
MSH	Management Sciences for Health
OB/GYN	obstetrician/gynecologist
PID	pelvic inflammatory disease
RH	reproductive health
RPM	Rational Pharmaceutical Management [project]
RPR	rapid precipitation reaction (test kit for syphilis)
STG	standard treatment guideline
STI	sexually transmitted infection
UTI	urinary tract infection
USAID	U.S. Agency for International Development
ZIHP	Zambia Integrated Health Project

Executive Summary

In 1998 the Central Board of Health (CBOH) and the Ministry of Health (MOH) of Zambia, recognizing that maternal mortality and morbidity are largely preventable, began drafting a five-year Integrated Reproductive Health Plan of Action. In designing the new policy, the Zambian government identified the essential role of pharmaceuticals, medical supplies, and other reproductive health (RH) commodities in making the new plan a functioning reality.

The Zambian government, specifically the MOH and CBOH, and the U.S. Agency for International Development (USAID) asked the Management Sciences for Health (MSH) Rational Pharmaceutical Management (RPM) project to assess the cost, availability, and use of commodities for RH services. In June and July 1999, a team of RPM staff, CBOH, and MOH officials, and others applied the Cost-Estimate Strategy (CES) tool at 14 hospitals and 139 health centers in 11 districts receiving assistance from USAID. The data provided critical information and highlighted the gaps in RH services that the new policies could help to address. Some of the types of information generated from this assessment include—

- Standard treatment guidelines, which were generally not used at surveyed facilities, were developed for 16 reproductive health conditions
- Estimated costs of providing RH drugs, supplies, and equipment nationally and in 11 sample districts
- Review of RH commodity availability in Zambia
- Standard treatment practices, as reported by health providers
- Service availability, as reported by clients

Several significant activities are under way as a result of the CES assessment. Donor agencies are currently using the CES data to help determine funding levels in-country. The process as a whole has contributed to closer coordination between donors and organizations working in the Zambian RH sector and it has heightened awareness of and stimulated discussion about the real costs of offering RH services.

Within Zambia, the cost and needs estimates will facilitate improved management of RH services in the 11 districts included in the study. In addition, impetus was given to developing STGs (best practices for treating a condition) for use by all facilities. Valuable data on commodity stock levels were gathered in the 11 sample districts that can be used, for example, to monitor and evaluate RH commodity availability at each facility and to focus training interventions for facility staff. In addition, other districts and facilities could be incorporated into these activities.

Introduction

Situation in Zambia

With a population of approximately 9 million, Zambia has an annual population growth rate of 2.5 percent. Reports show that the total fertility rate dropped from 7.2 in 1978 to 5.6 in 1998, and immunization of children under five is rising. Despite these positive trends, the recent resurgence of several common diseases, such as malaria, tuberculosis, acute respiratory infections, and sexually transmitted infections (STIs), has stretched the government's human and financial capacity to their limits. The health care establishment has been further crippled by the HIV/AIDS pandemic that is affecting all of Sub-Saharan Africa. In fact, Zambia has one of the highest HIV/AIDS infection rates in Africa. Combined, these factors have led to a dramatic decrease in life expectancy, which between 1978 and 1998 dropped from 48 to 40 years for males and from 51 to 41 years for females, as reported by the World Health Organization.

In the early 1990s, the Zambian MOH launched a national Health Sector Reform project and devoted its energy to improving the quality of care of the Zambian people. This important commitment by the Zambian Government came at a time when the health status of its citizens was at a critical point and health systems and institutions were facing severe limitations.

In accordance with the new health sector reforms, the Zambian pharmaceutical sector has also experienced important changes. The MOH developed a National Drug Policy that proposed an increase in the drug budget. Hoping to improve pharmaceutical sector efficiency, the MOH began to implement a series of pharmaceutical reforms in 1998. These reforms included creating a new independent regulatory body, hiring a full-time pharmacist at the Central Board of Health (CBOH), integrating the commodity logistics systems of various vertical programs, and subcontracting the management of the Central Medical Stores to a private company. In addition, using software developed by MSH/RPM, the Central Medical Stores upgraded its inventory management system.

Despite the innovative changes and reforms, the health supply system remained donor-dependent, particularly for supplying essential drugs to rural health centers. Despite the new Health Sector Reform initiatives, pharmaceutical sector problems culminated in 1998, when an international drug procurement process funded through a World Bank loan failed to meet Bank standards. Consequently, Zambia faced a serious shortage of drugs and limited funds to improve the situation.

New reproductive health policy

The burden of maternal mortality and morbidity in Zambia is among the highest in Africa. To protect the most vulnerable group from risk of complications from pregnancy, nutritional deficiencies, STIs, and other RH conditions, the MOH and CBOH have taken steps to streamline policies regarding reproductive health. These steps build onto the Health Sector Reforms described above.

In 1998 a team of national and international experts was invited to conceptualize an Integrated Reproductive Health Plan of Action. The resulting draft report stressed that good maternal health is essential to the health and survival of the mother and her newborn. The action plan recognized the importance of the availability of capable personnel and RH commodities in treating key RH conditions. The team of experts recommended that health posts, health centers, and hospitals be equipped with trained personnel, drugs, equipment, and essential supplies for both preventive care and cases of emergencies and complications.

The draft document recognized that, if complications arise, emergency services should be ready with trained personnel, drugs, equipment and essential supplies. Also, the availability of essential drugs and medical supplies, such as iron folate supplements, tetanus immunizations, Vitamin A supplements, birthing kits and equipment, hypertension drugs, diagnosis material for eclampsia, and the most essential antibiotics to treat urinary tract and syphilis infections, is integral to running a service that had a positive health impact on mother and baby.

Improving Integrated Reproductive Health in Zambia requires a sector wide approach and interventions at different levels of the health system. Although the MOH was aware that tertiary and district hospitals were severely affected by the drug shortage, it was not clear what the needs were or what it would cost to meet those needs. Therefore, the draft plan recommended that a comprehensive review be conducted in the districts to estimate the costs of treating RH conditions. RPM was asked to apply the Cost-Estimate Strategy (CES) for that purpose.

CES method – brief overview

The Cost-Estimate Strategy guides decision making for improving the availability and management of RH commodities. It also provides a framework for incorporating cost information into policy and program decisions. Using spreadsheet tools and surveys, the CES helps collect, calculate, and compare RH cost data. The CES estimates, which form the foundation of the tool, help users generate total RH commodity costs for a range of treatments and services. “What-if” scenarios can be assessed by substituting alternative drugs and/or prices, and comparisons between the estimates enable managers to identify the cost implications of alternative services and treatment protocols.

Zambian officials learned of the CES following its field test in Kenya in 1998. The CES tool seemed particularly relevant to the Zambian RH Integrated Action Plan. The CES aims to—

- Improve reproductive health (RH) policy decisions
- Plan and budget within RH programs
- Use RH funds more efficiently
- Improve drug and equipment supply systems
- Promote rational use of drugs and equipment

Therefore, the MOH, CBOH, and USAID/Zambia requested that RPM apply the CES to assess the availability of RH drugs, medical supplies, and equipment; identify and cost projected needs; and set standard treatment guidelines.

The data for this report focuses primarily on eleven districts that participate in the USAID Zambia Integrated Health Project (ZIHP). Data for this report were compiled in June and July 1999 from sources in Lusaka and Washington, questionnaires, assessment, evaluations, special reports, national health census, registration data, and from a two-week visit to Zambia by one RPM senior technical officer and a local RPM consultant.

Objectives of the assessment

Together, RPM, the MOH, CBOH, and USAID coordinated the CES application to assist the Zambian government in carrying out the new RH policies.

Three general objectives for the assessment were quickly defined:

- Assess the RH supply situation
- Inform the new Integrated Reproductive Health Plan of Action
- Assist the CBOH in leveraging donor funding

As empowered and informed decision makers, the CBOH and partners should no longer face the uncertainty of what is needed to amend policies, prepare action plans, request external assistance from all partners to gear everybody towards realistic interventions of life saving care to all Zambian citizens.

Methodology

The Cost-Estimate Strategy is a tool developed by the Reproductive Health Working Group (composed of RPM, the MotherCare project of John Snow, Inc., and USAID) to assist reproductive health program managers, governments, and the donor community to better estimate the cost of RH commodities (drugs, equipment, and supplies). It is often the case that systematically collected information is not readily available for management purposes. To address this gap, the CES provides cost and needs information that can help guide decision making for improving the availability and management of RH commodities.

The Cost-Estimate Strategy is a planning, budgeting, and management tool for reproductive health commodities. The CES can be used to identify essential pharmaceuticals, medical supplies, and medical equipment for basic reproductive health services and then to estimate the cost of supplying the required quantities of those commodities. The cost implications of alternative scenarios—based on different treatment options, target populations, or service expansion—can be calculated and analyzed. Indications of where and how reproductive health commodity management is failing to contribute to quality services can be identified and the basis for solutions established.

The following provides a general overview of the CES study design in Zambia, specifically the choice of study sites, the personnel involved in the study, and the sources of price information used to generate the cost estimates.

Study sites

In Zambia, a sample group of facilities in 11 districts was chosen to represent the districts in areas where the USAID-funded Zambia Integrated Health Project (ZIHP) was implementing various health-related activities (see Annex A for a full list of survey facilities). The districts were located in six provinces. The 14 hospitals included in the study represent 87.5 percent of the hospitals in the 11 districts (see Table 1).

Table 1. Number of hospitals surveyed by type of administration

Province		District	Number of Hospitals Surveyed by Type and Administration					
	Total		Total per District	Government			Mission	Industry
				Central	General	District		
Central	3	Chibombo	1			1		
		Kabwe	2		1			1
Copperbelt	2	Kitwe	1	1				
		Ndola	1	1				
Eastern	3	Chipata	2		1		1	
		Lundazi	1			1		
Northern	1	Kasama	1		1			
Southern	1	Kalomo	0					
		Livingstone	1		1			
Luapula	4	Mwense	2			1	1	
		Samfya	2			1	1	
TOTAL	14		14	2	4	4	3	1
				10				

Of the 230 health centers in these target districts, 139 health centers were visited, representing 60.4 percent of health centers (see Table 2). Those health centers where data collectors were not able to visit, due to limited time and resources available for the data collection and logistical difficulties, tended to be located in remote areas.

Table 2. Number of health centers surveyed by type of administration

Province		District	Number of Facilities						
	Total # of HC visited per Province		Total # of HC in the District	Total # of HC visited (%)	Government		Mission	Industry	
					Urban	Rural	Rural	Urban	Rural
Central	18	Chibombo	22	11 (50)		11			
		Kabwe	21	7 (33)	6				1
Copperbelt	27	Kitwe	17	11 (65)	11				
		Ndola	22	16 (73)	16				
Eastern	37	Chipata	29	20 (69)	1	18	1		
		Lundazi	20	17 (85)		16	1		
Northern	11	Kasama	23	11 (48)		11			
Southern	23	Kalomo	20	11 (55)		10	1		
		Livingstone	13	12 (92)	11			1	
Luapula	23	Mwense	21	12 (57)		10	1		1
		Samfya	22	11 (50)		11			
TOTAL	139		230	139 (60.4)	45	87	4	1	2
					132			3	

Study team

Two RPM staff and one Zambian consultant coordinated the assessment. To help meet the objectives, RPM staff organized several roundtables and meetings with senior RH managers from the MOH, CBOH, university teaching hospital, and the nursing school. The meetings contributed to customizing the tool to the Zambian context. Local experts identified 14 RH conditions for study and established other survey parameters. In the absence of official Zambian RH standard treatment guidelines, RPM seized the opportunity to develop draft RH STGs and standard lists of drugs, equipment, and supplies for RH interventions.

A team of data collectors, made up of nurses, midwives, pharmacists, pharmacy technicians, and clinical officers, was trained over a one-week period. They actively participated in the discussions leading to the development of the STG and RH commodity requirements. With these guidelines and the CES data collection tools, the team visited sites and collected data in each of the 11 districts in just three weeks.

Next, RPM staff in Zambia and the United States reviewed and entered the data into the cost-estimate database. To complete the estimates, RPM derived national RH caseload estimates and average local and international prices. National caseload numbers were based on epidemiological data from the 1996 Zambia Demographic Health Survey.

Price information

The local drugs and supply prices, when available, were obtained from 30 local suppliers and historical MOH bidding documents, representing the actual prices in-country. Average international drug and supply costs were obtained from the *International Drug Price Indicator Guide* published by MSH in 1998 and from the International Dispensary Association's price catalogs. This comparison information is useful because if local prices are higher than international prices it indicates that lowering costs is feasible.

Note that all costs listed refer only to commodity costs and exclude other potential costs such as infrastructure, personnel, and administrative costs. Depending on the information available, estimates are presented in both U.S. dollars (US$) and Zambian kwacha (using an exchange rate of US$1 = 2,600 kwacha).

Applying the CES Tool in Zambia

As mentioned in the previous chapter, the CES tool centers on two main segments, the cost estimate model and the survey. These are described below in detail.

Cost-Estimate Strategy model

The cost estimate model is at the core of the CES tool, helping managers to better estimate the costs of commodities needed to provide the services offered by an RH program. Spreadsheets are used to calculate the total quantity and costs of drugs, supplies, and medical equipment necessary to carry out selected RH treatments. A reference database of commonly used drugs and supplies is contained in each spreadsheet, and formulas are embedded to automatically calculate subtotals and summarize results. Combined, these functions are intended to—

- Identify essential commodity items based on the selected treatment protocols for target reproductive health conditions and services
- Estimate total quantity and costs of drugs, supplies, and medical equipment in 11 ZIHP districts for major reproductive health conditions and services
- Highlight cost implications of treatment options available
- Produce lists of essential commodities for selected reproductive health conditions.

The cost estimate activities were applied to the Zambian context via the following steps:

Step 1: Identify key reproductive health conditions and services

Based on the latest draft of the Integrated Reproductive Health in Zambia Plan of Action 1999-2004, the following 14 reproductive health conditions and services which require drugs, medical supplies and medical equipment were identified by the study team through consultations with key local experts:

- Basic antenatal care, including provision of:
  - ferrous sulfate and folic acid
  - tetanus toxoid
  - malarial prophylaxis
  - treatment of worm infestation
  - basic laboratory tests including urinalysis, hemoglobin, blood grouping and Rh test, and screening of syphilis
- Antenatal treatment (e.g., malaria treatment of pregnant women)
- Clean and safe delivery
- Family planning (including vasectomy and tubal ligation)
- Lacerations and episiotomy
- Pre-eclampsia and eclampsia
- Cesarean section

- Puerperal sepsis
- Neonatal sepsis
- Hemorrhage
- Mastitis
- Genital ulcer disease
- Vaginal discharge without pain
- Vaginal discharge with pain

Other critical reproductive health services such as education and counseling activities were not included because they do not require the commodities that this study aimed to assess.

Step 2: Develop treatment regimens for each condition

In the absence of standard treatment guidelines (STGs) for the identified conditions, the study team developed Zambia-specific treatment protocols for each condition. Creating STGs is an effective method for standardizing the way health care providers use drugs to treat patients and their conditions. STGs define how and with which drugs practitioners should treat common health conditions. The CES team developed STGs based on international guidelines, national policies, and expert opinions on treating the conditions locally. The team used CES Treatment Sheets to compile the data.

A treatment sheet is a one-page summary of drugs and supplies necessary to complete the selected regimen. These were provided to clinicians supporting the CES process or on the CES team, who then filled in the form based on actual practices and what they think the treatment norm should be. The team then met to review all of the treatment sheets submitted and arrived at consensus on treatment regimens for each condition.

Using treatment regimens identified in Step 2, the team generated lists of drugs and medical supplies necessary for treating the 14 targeted reproductive health conditions in Zambia (the treatment sheets for all 16 conditions are shown in Annex B).

Step 3: Assign prices to each commodity

Each commodity on the list developed in step 2 was assigned a local and international price. These prices were collected as follows:

- *Local prices* – These prices were based on the median values of unit prices provided by private suppliers in Lusaka contacted. Ten out of 30 registered local suppliers responded to our requests and sent price quotes for specific commodity items.

- *International prices* – These prices were based primarily on bidding prices of international bidders from the 1997 open international tender in Zambia. When the information was not available from tender documents, standard average international prices were used from the International Drug Price Indicator Guide and the International Dispensary Association's catalogue.

For purposes of the CES Zambia study, an exchange rate of 1 US$=2600 kwacha was used throughout. Local prices were not available for 7 drugs (including blood and plasma) and blood giving set.

Step 4: Estimate average episodic costs of drugs and medical supplies

The two sets (local and international) of cost information was entered into the Zambia CES Costing Model to estimate episodic costs of drugs and medical supplies for each selected target condition and service. Episodic costs in the CES Costing Model are the total costs of drugs and medical supplies to complete a course of the selected treatment protocol for one average case. When multiple treatment options are selected for single condition, weighted average episodic costs were calculated by taking into account weights assigned to each option according to estimated proportion of cases treated with different options (see Step 2). The weighted average episodic costs of drugs and medical supplies were then used to estimate total drug and supply requirements in 11 districts as described in Step 5 below.

Estimated costs are based on the median values (in kwacha) of unit prices given by local suppliers. As mentioned above, local prices were not available for 7 drugs (including blood and plasma) and blood giving set. Episodic costs for 6 conditions whose treatment include these items (i.e., pre-eclampsia, C-section, hemorrhage, family planning, tubal ligation, and vaginal discharge with pain) were, therefore, calculated without costs of these 8 items.

Step 5: Estimate district- and national-level caseloads

For caseload data, the Zambia CES Model used the reported or estimated number of cases currently seeking care at health facilities for each target reproductive health condition. The study team sought as much demographic data, epidemiological data, and service utilization data as possible from national, provincial, and district level sources. Epidemiological data for a number of reproductive health conditions included in this assessment (e.g., laceration and episiotomy, pre-eclampsia and eclampsia, puerperal and neonatal sepsis, hemorrhage, and mastitis) were very difficult to obtain at all levels, and especially so at the district level. Morbidity data for GUD, vaginal discharge without pain, and vaginal discharge with pain were not available. In some cases the CES team extrapolated from available data to estimate caseload at the national or district level, as discussed below:

- The team in some cases estimated caseloads for the districts based on available national caseload data.
- When only district data were available, as for C-section and STIs, the team estimated national caseload from the district data.
- Caseload for vasectomy and tubal ligation were not available at the time of this report.

Annexes C and D contain the caseload estimates and sources used in this report, along with other population information.

Step 6: Estimate total drug and medial supply requirements and costs for the target population

The two target populations for this study were the 11 districts and the total Zambian population. Using episodic costs (step 4) and estimated caseload data (step 5), the CES team calculated the total estimated cost of drugs and supplies for providing RH treatment nationwide. The total requirements for the 11 districts were calculated as a percentage of the national totals.

Step 7: Determine the equipment "package"

The study team consulted local experts to detail the medical equipment needed by health facilities to provide essential reproductive health services. First, the local experts identified and grouped the basic types of reproductive health services that are provided at each level of care, from health center to hospital. Three packages of reproductive health services were defined from this process, namely:

- Basic antenatal care
- Clean and safe delivery
- Obstetric surgical procedures.

Next, the local experts identified equipment items and the number of units of each item that is necessary for each service package. In some cases, local counterparts included certain items as recommended additional items. For example, ultrasound machines were not likely to be found or used at the lowest level of care. Therefore, it was not included as basic ANC equipment but is listed as a recommended item. The contents of each equipment package chosen by the team are listed in Annex E.

Each item was assigned an international and local price, where available, as described in Step 3.

Step 7: Estimate total medical equipment requirements

The number of health care facilities nationwide was used to estimate the total medical equipment requirement. Total number of facilities in Zambia and in 11 districts was obtained from the information provided by the CBOH and the Health Facilities in Zambia (MOH 1995), with supplemental information for additional new facilities.

In consultation with local experts, the study team decided on the number of each type of equipment package (i.e., basic ANC, clean and safe delivery, and obstetric surgery) required for health centers, district hospitals, mission hospitals, general hospitals, and central hospitals. Total medical equipment needs were calculated by estimating the number packages required by each facility level.

CES survey

The CES model estimates the theoretical needs of reproductive health commodities based on treatment norms and estimated national caseload data. To compliment the estimates, the CES survey was conducted to assess:

- Staffing, basic infrastructure, and services at health facilities
- Availability of key drugs, medical supplies and equipment at health facilities
- Reported treatment practices for key reproductive health conditions among health care providers through interviews
- Actual treatment practices of health care providers for key reproductive health conditions through interview of pregnant mothers visiting antenatal care or newly delivered postnatal mothers at facilities.

Data collection instruments

The following three survey forms were developed for the Zambia CES assessment by adapting the CES survey templates to reflect the reproductive health care delivery system and the objectives of the survey in Zambia:

C *Health Facility Survey Form* is composed of five sections – facility and staffing, services, emergency services, infrastructure and equipment check list, and drug and supply check list – and was used to assess availability of services and commodities that were deemed necessary to provide quality reproductive health care.

C *Health Care Provider Questionnaire* was used with a maximum of four staff per facility (physician, clinical officer, and two nurse midwives/nurses/midwives).

C *Mother Interview Form* was used to collect information regarding services provided during the antenatal care and labor/delivery from clients' perspectives.

Limitations of the data

It is important to recognize that although the questionnaires were developed for standardized measurements of a local situation, there are not enough data available to give a complete picture of the current status of implementation of integrated reproductive health strategies in Zambia. To place the supply system in context, additional information is needed about the local situation of each district. For example, when the data were collected in Zambia (August-September 1999), the supply situation at district level (outside Lusaka) was at its worst due to multiple delays in the procurement process.

The inventory and drug prescribing data available were also often incomplete. Data on standard treatment and dosage regimens used in the facilities were rarely available and consistent. Epidemiological data were difficult to obtain.

Pricing data from MOH acquisition were not available at district level and when they were made available they did not include cost of transportation or handling fees. The international prices used provide an indication of generic drug prices on the international market

Developing Standard Treatment Guidelines

The Methodology section summarized the basic steps followed by the CES team. By following the steps, the team was able to compile significant data on the cost of providing RH care in Zambia. However, in order to begin estimating costs it was first necessary to define each of the services.

Once the RH conditions were chosen, RPM and local counterparts determined the standard treatment guidelines, or best practices, that would be used to evaluate each condition. STGs give practitioners concrete procedures for addressing a given condition and can help reduce costs caused by inappropriate or expensive treatments. Up-to-date and comprehensive STGs for reproductive health services did not exist in Zambia prior to the CES exercise. For purposes of the CES, STGs provided lists of the drugs and supplies needed for each condition. These lists, in turn, formed the basis of the cost-estimates. The CES STGs are not official STGs but are instead based on practices recommended by the team of Zambian and international experts informing the CES process.

Surveyors noted that STGs were not available or in use in almost all of the facilities visited, suggesting a gap in treatment information and practices. For example, basic antenatal care practices include the provision of five basic drugs and supplements. Prescribing rates for these pharmaceuticals were low, especially for chloroquine.

To help fill this gap between best practices and action, RPM submitted the CES STGs to the CBOH. Concurrently, the CBOH is in the process of defining the national-level STGs, with technical support from RPM. The CES STGs will be helpful in setting the national treatment protocols for the 14 RH conditions and services.

At the time of the study there was a significant lack of information and knowledge on local practices, costs, and availability. The CES data fills that gap. Baseline RH commodity cost information and can be used by a host of potential users as they plan for RH services in Zambia. For example, comparisons of international with local costs can reveal opportunities for cost savings. Similarly, the cost-estimates can help MOH personnel plan for the coming year's RH services budget.

Because the CES reveals the estimated costs and needs, planners are better able to understand just what it will take to meet the country's RH needs. In particular, the Zambian government can use the information to identify at what level the MOH can provide support to RH services. Once this is understood, the MOH can look for ways to meet the remaining needs.

To generate the estimates, RPM took into account the drugs and supplies used for the conditions and procedures. These data were combined with local and national caseload data and local and national price data. With the quantitative information in hand, RPM produced numerous estimates for treating the conditions. Note that all costs listed refer only to commodity costs and exclude other potential costs such as infrastructure, personnel, and administrative costs.

This section presents the results of the cost estimation activities. The following types of estimates were generated using the CES tool—

- Episodic costs of drugs and supplies for each condition
- Total drug and supply requirements and costs in the 11 districts
- Total national drug and supply requirements and costs
- Medical equipment needs and costs

For each set of data, costs were compared when using local and international prices. Each of the estimates is discussed in detail below.

It is important to note that, in recent years, family planning commodities in Zambia have been almost entirely donor funded. The needs and cost estimates will be useful tools for donors and the Zambian government as they plan and procure to meet family planning needs.

Episodic costs of drugs and supplies for each condition

Calculating episodic costs

As indicated in Step 4, the team estimated the cost per episode (or weighted cost per episode when various treatment options existed) of drugs and supplies for each RH condition. The raw data on episodic cost calculations is presented in Table 3.

Table 3. Average weighted case costs of drugs and supplies using local prices (in Kwacha)

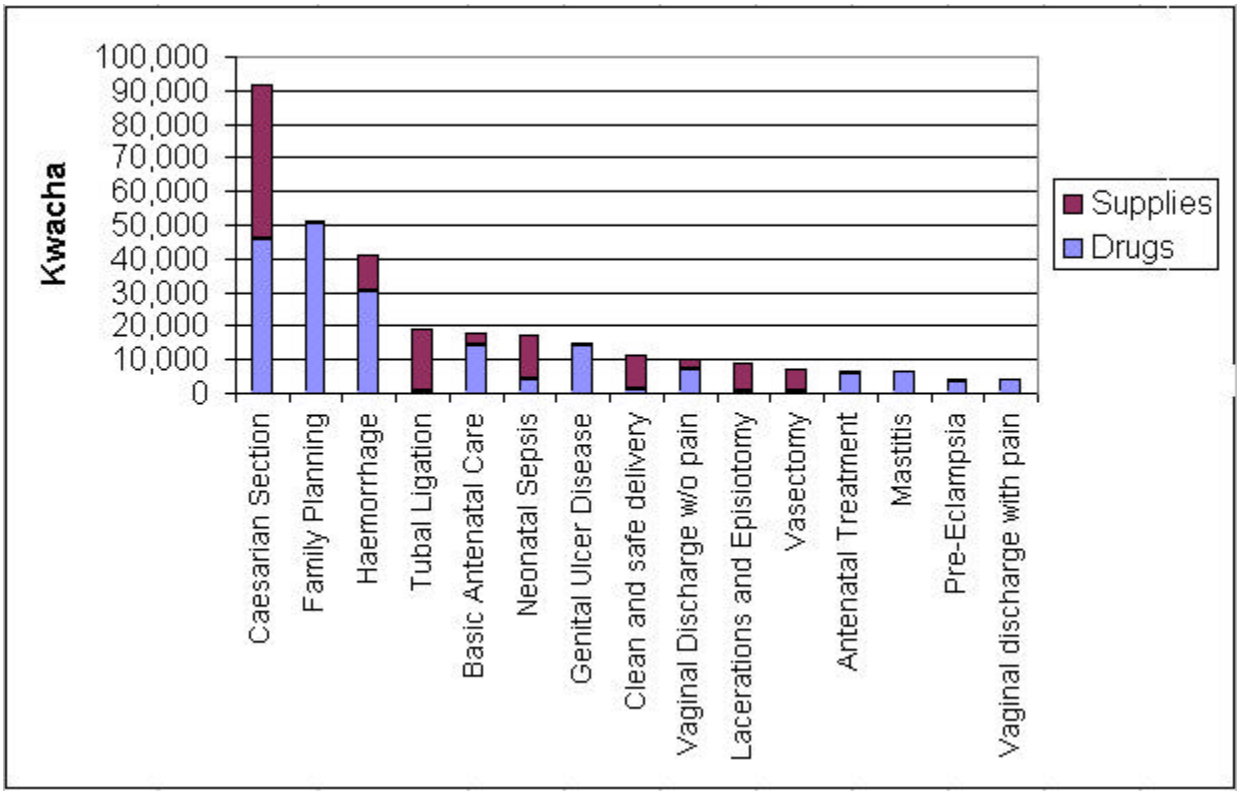
Treatment type	Health condition	Weighted average case cost *			Items whose price information is missing	
		Drugs	Supplies	Total	Drugs	Supplies
Antenatal Care	Basic Antenatal Care	14,571	3,292	17,862		
	Antenatal Treatment	5,946	879	6,825		
	Pre-Eclampsia	3,813	596	4,409	Magnesium Sulfate	
Deliveries	Clean and safe delivery	1,467	9,960	11,426		
	Lacerations and Episiotomy	393	8,614	9,007		
	Cesarean Section	45,729	46,010	91,739	Blood	Blood giving set
Postnatal Care	Haemorrhage	30,253	10,936	41,189	Blood, Plasma	Blood giving set
	Puerperal Sepsis	348,291	27,056	375,347		
	Neonatal Sepsis	4,194	12,801	16,995		
	Mastitis	6,579	103	6,683		
Family Planning	Family Planning	50,298	984	51,282	8 int'l prices, 3 local prices	
	Vasectomy	386	6,910	7,296		
	Tubal Ligation	386	18,797	19,183	Lorazepam	
STD	Genital Ulcer Disease	14,361	612	14,972		
	Vaginal Discharge without pain	7,327	3,059	10,386		
	Vaginal discharge with pain	4,141	184	4,324	Spectinomycin local price	

Table 3 summarizes the weighted average costs of drugs and medical supplies estimated by the Zambia CES Costing Model for 16 conditions, services, and procedures (counting vasectomy and tubal ligation separately from other family planning methods). Table 3 also indicates where price information was missing for the different conditions.

Estimated costs are based on the median values (in Kwacha) of unit prices given by local suppliers. Local prices were not available for several drugs (including blood and plasma) and blood giving set. Episodic costs for 6 conditions whose treatment include these items (i.e., pre-eclampsia/eclampsia, C-section, hemorrhage, family planning, tubal ligation, and vaginal discharge with pain) were, therefore, calculated without costs of these items.

Figure 1 is a graphic representation of the breakdown of episodic costs among drugs and supplies for each condition, excluding puerperal sepsis.

Figure 1. Weighted average episodic costs of drugs and supplies based on local prices (Kwacha)



Key observations regarding episodic costs of drugs and supplies are as follows:

- The most expensive treatment among 16 reproductive health conditions and procedures evaluated was puerperal sepsis (K 375,347), followed by C-section (K 91,739) and family planning[1] (K 51,282).
- The major reason for high estimated cost for puerperal sepsis is the high local costs of penicillin G sodium injection and metronidazole suspension used in the recommended treatment protocol. Median unit price of 1 MU vial of penicillin G sodium provided by local suppliers in Lusaka was 1,700 Kwacha and 1,750 Kwacha for a 5 mg vial of metronidazole suspension. The seven-day course of treatment with penicillin G sodium (four times a day) and metronidazole (three times a day) resulted in the high average costs for puerperal sepsis when local prices were used.
- Costs for medical supplies were a major part of total costs in C-section (e.g., IV set and suture), tubal ligation (suture, cotton wool, and sterile gloves), neonatal sepsis (IV set and canulae), clean and safe delivery (hypochloride and sterile gloves), laceration and episiotomy (suture), and vasectomy (suture). (See Figure 1.)

Comparing episodic costs using local and international prices

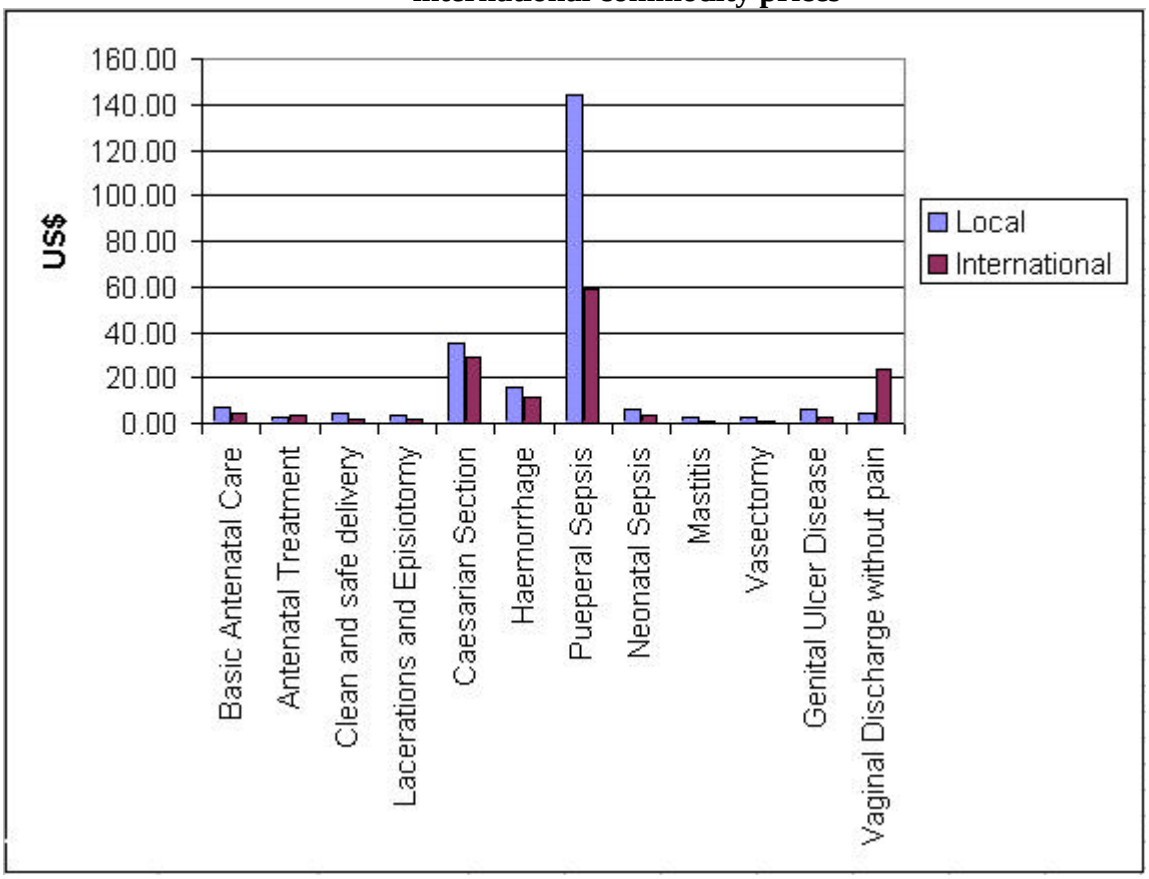
In order to assess how decisions on procurement sources may affect overall commodity costs, the team calculated the weighted average episodic costs for each condition using both local and international prices. The same treatment protocols were used for both calculations. Figure 2 presents a comparison of the cost per episode in US dollars of 12 reproductive health conditions. Only these 12 conditions had complete price information for local and international prices.

- International commodity prices for items necessary to provide care and treatment for ANC, clean and safe delivery, laceration and episiotomy, neonatal sepsis, mastitis, vasectomy, and genital ulcer disease were generally comparable with or cheaper than local prices.

- Higher drug and supply costs from international sources were observed for C-section, hemorrhage, and vaginal discharge without pain. The differences in episodic costs of these conditions can be mostly attributed to price differences in two drugs – normal saline (for C-section and hemorrhage), and tetracycline (for vaginal discharge without pain).

[1] Family planning commodity costs listed here were calculated as the weighted average costs associated with 9 contraceptive methods available in Zambia.

Figure 2. Comparison of weighted average episodic costs based on local and international commodity prices



- The local median price of penicillin G sodium (US$0.65) was four times more expensive than the international price ($0.15). High unit costs of penicillin G sodium and the total quantity necessary to complete the regimen (112 vials per case) made the local episodic cost of one case of puerperal sepsis ($114.17) three times more expensive than the episodic cost based on international prices ($36.80).

National cost estimates

Calculating total costs using local prices

Total drug and supply costs for the 14 target conditions (excluding vasectomy and tubal ligation due to lack of annual caseload information) were estimated by multiplying weighted average episodic commodity costs using local procurement prices and the estimated caseload at national level for each selected conditions and services. The results of these calculations are listed in Table 4.

Table 4. Summary of drug and supply cost estimates for current cases at all health facilities in Zambia (in Kwacha)

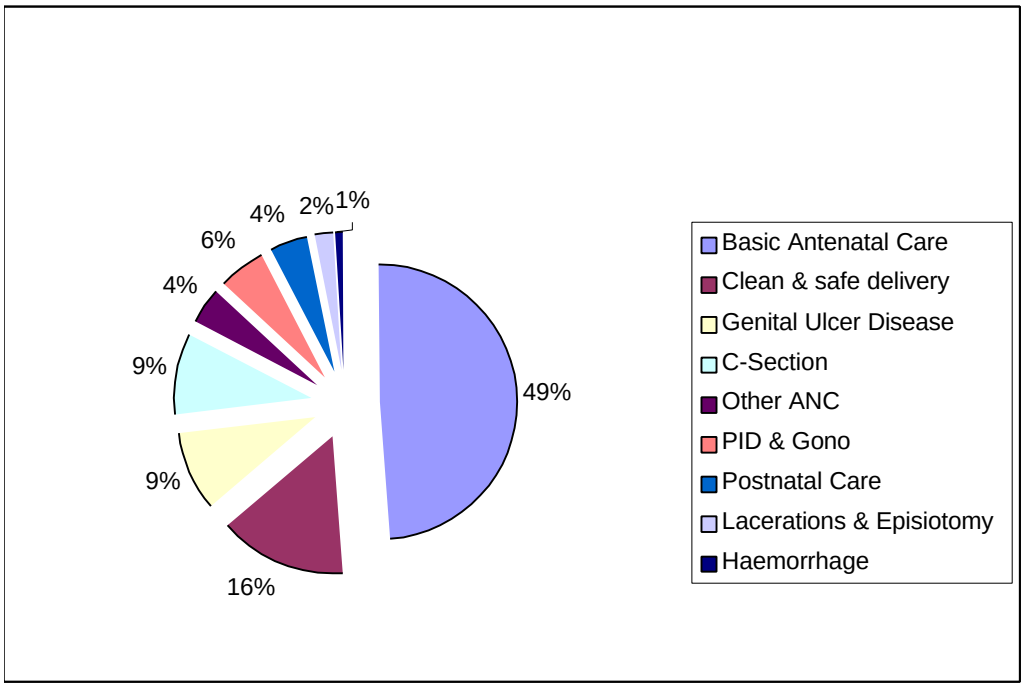
Treatment type	Health problem/ Condition	Cost/ Case	# Cases	Total Weighted Cost			
				Drugs	Supplies	Total	% of total
Antenatal Care	Basic Antenatal Care	17,862.07	311,714	4,541,845,444	1,026,018,164	5,567,863,608	14%
	Antenatal Treatment	6,825.43	72,318	430,024,992	63,574,141	493,599,132	1.2%
	Pre-Eclampsia	4,409.10	1,545	5,892,410	920,878	6,813,288	.02%
Deliveries	Clean and safe delivery	11,426.40	154,528	226,615,121	1,539,082,132	1,765,697,254	4.5%
	Lacerations and Episiotomy	9,007.05	28,897	11,356,408	248,917,719	260,274,127	.7%
	Caesarian Section	91,738.91	12,517	572,374,703	575,899,028	1,148,273,731	3%
Postnatal Care	Haemorrhage	41,189.49	2,318	70,123,975	25,349,888	95,473,862	.25%
	Puerperal Sepsis	375,347.16	1,545	538,207,359	41,808,612	580,015,971	1.5%
	Neonatal Sepsis	16,994.91	1,545	6,481,525	19,780,340	26,261,865	.07%
	Mastitis	6,682.56	1,545	10,166,852	159,560	10,326,412	.03%
Family Planning	Family Planning	51,281.79	541,422	27,232,424,063	532,667,490	27,765,091,553	70%
STD	Genital Ulcer Disease	14,972.43	73,482	1,055,244,433	44,959,962	1,100,204,395	2.7%
	Vaginal Discharge without pain	10,386.25	65,974	483,391,498	201,830,960	685,222,458	1.7%
	Vaginal discharge with pain	4,324.38	38,377	158,912,249	7,044,290	165,956,539	.41%
			Total	35,343,061,033	4,328,013,163	39,671,074,196	~ 100%

Estimated commodity costs for non-sterilization methods of family planning represents 70% of total commodity needs for integrated reproductive health services in Zambia. This is in part the result of the large estimated number of users, whereas other conditions do not have as large a caseload.[2]

Figure 3 shows the breakdown by conditions of total drug and supply costs using local commodity prices, except family planning services. When family planning costs are excluded from the total drug and supply estimates for Zambia:

[2] The number of family planning users was determined by dividing the number of contraceptives issued in 1998 by the Couple Year of Protection Factor (i.e., the number of condoms or cycles of contraceptive pills, etc. required for a year of protection).

Figure 3. Breakdown of total commodity costs by conditions and services (local prices)



- Half of the total drugs and supply costs were attributable to basic antenatal care. The treatment includes ferrous sulfate and folic acid for 6.5 months (196 days) during the pregnancy. If the length of these treatments is shortened to 4 months (120 days), the percentage of basic antenatal care in the total drug and supply needs, excluding family planning, can be reduced from 49 to 42 percent. However, basic ANC commodities still represents the major part of commodity costs for target reproductive health conditions.
- Clean and safe delivery represents 16 % of total drug and supply needs based on 46.5 percent of deliveries occurring at health facilities. If facility-based births increase, the proportion of commodity costs necessary for delivery will increase. For example, if 75 percent of deliveries occur at health facilities, 23 percent of total drug and supply costs for non-family planning services would be necessary to provide adequate care during these deliveries at national level.
- Despite high episodic drug and supply cost of the selected treatment protocol for puerperal sepsis, its impact on the total commodity requirements was not significant (4 %) because of relatively small number of expected cases.
- The survey found that laceration and episiotomy were conducted for a relatively high proportion of deliveries (18.7%). When this caseload figure was applied to the national level estimate, 2.3 percent of total drug and supply costs would need to be allocated to laceration and episiotomy. In order to assess impacts of lower national caseloads of laceration and episiotomy on the total commodity costs, a sensitivity analysis was conducted. For example, if these procedures were conducted on average to 5% of women during delivery at national level rather than 18.7%, the total drug and supply costs for these procedures would be reduced from 260,274,127 Kwacha to about 68,029,000 Kwacha (73 % reduction) nationally.

Comparing total drug and supply costs using local and international prices

Table 5 provides a comparison of total costs of drugs and supplies for 12 of the target conditions using local and international procurement prices. Comparing local and international prices helps identify areas that, by procuring commodities using other available prices, will result in cost savings for Zambia.

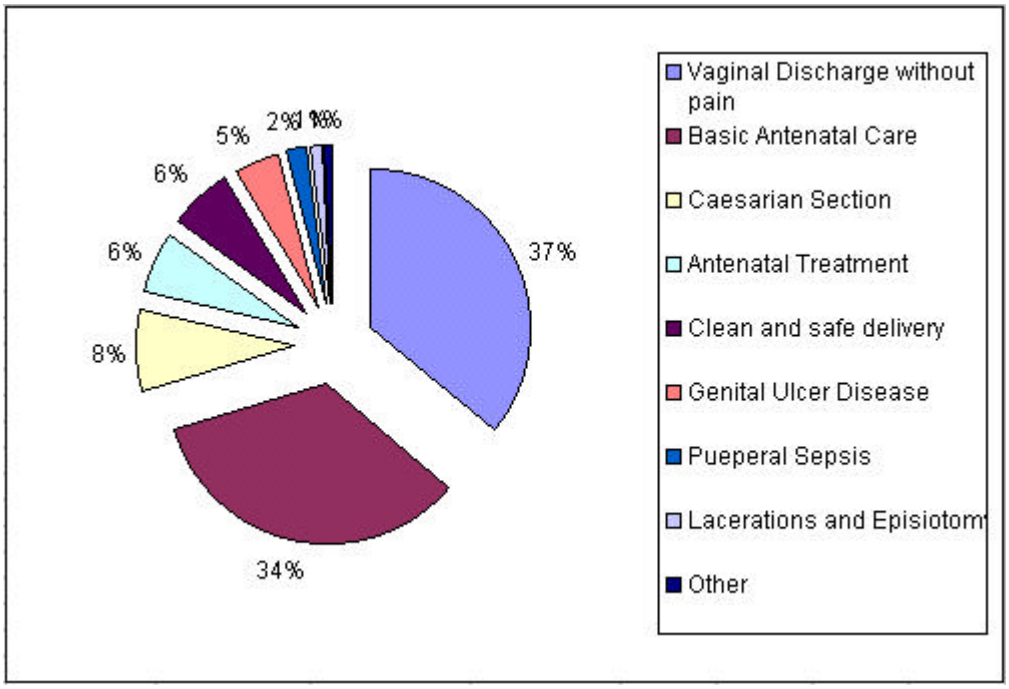
Table 5. Comparison of national total costs using international and local prices

Treatment Type	Health Problem/ Condition	Cost /Case ($)		Estimated annual Caseload	Total Cost in Zambia ($)	
		Int'l Prices	Local Prices		Int'l Prices	Local Prices
Antenatal Care	Basic Antenatal Care	4.73	6.87	311,714	1,475,936	2,141,486
	Antenatal Treatment	3.90	2.63	72,318	282,156	189,846
Deliveries	Clean and safe delivery	1.78	4.39	154,528	274,292	679,114
	Lacerations and Episiotomy	1.85	3.46	28,897	53,560	100,105
	Caesarian Section	28.99	35.28	12,517	362,905	441,644
	Haemorrhage	11.82	15.84	2,318	27,405	36,721
Postnatal Care	Puerperal Sepsis	58.55	144.36	1,545	90,469	223,083
	Neonatal Sepsis	3.50	6.54	1,545	5,405	10,101
	Mastitis	1.15	2.57	1,545	1,779	3,972
STD	Genital Ulcer Disease	2.69	5.76	73,482	197,468	423,156
	Vaginal Discharge without pain	23.86	3.99	65,974	1,573,909	263,547
				Total	4,345,283	4,512,774

This table clearly shows that international prices were lower than local prices for the 12 conditions, with the exception of vaginal discharge without pain. It is possible that international prices were lower because of favorable procurement practices, including bulk purchasing and competitive tendering, that can lead to lower prices. Local suppliers often respond to small, local, non-competitive procurements that are often levied more taxes than international procurements.

The relatively high international cost of treating vaginal discharge without pain is attributable to high international costs of tetracycline coupled with a large number of cases nationwide. The data available indicate that, if the cost of purchasing tetracycline tablets internationally is high, vaginal discharge could form a significant portion of total drug and supply costs, as seen in Figure 4.

Figure 4. Breakdown of total RH drug and supply costs in Zambia based on international prices



Cost estimates for the 11 sample districts

Calculating total costs using local costs

Total drug and medical supply costs in 11 districts were estimated in the same way as the national estimates. RPM calculated total costs for the 11 districts using the weighted average episodic costs and estimated caseload in the districts. Caseload in the 11 districts was calculated as a percentage of the national caseload for each condition. The estimated total costs using local prices are shown in Table 6.

Table 6. Summary of drug and supply cost estimates for current cases at all health facilities in 11 districts (Kwacha)

Treatment type	Health problem/Condition	Cost/ Case	Estimated # Cases	Total Weighted Cost		
				Drugs	Supplies	Total
Antenatal Care	Basic Antenatal Care	17,862	87,280	1,271,716,178	287,284,962	1,559,001,140
	Antenatal Treatment	6,825	29,501	175,420,464	25,933,854	201,354,318
	Pre-Eclampsia	4,409	433	1,649,874	257,846	1,907,720
Deliveries	Clean and safe delivery	11,426	43,268	63,452,207	430,942,812	494,395,019
	Lacerations and Episiotomy	9,007	8,091	3,179,793	69,696,931	72,876,724
	Caesarian Section	91,739	3,505	160,264,848	161,251,658	321,516,506
Postnatal Care	Haemorrhage	41,189	649	19,634,704	7,097,965	26,732,670
	Puerperal Sepsis	375,347	433	150,697,996	11,706,406	162,404,402
	Neonatal Sepsis	16,995	433	1,814,826	5,538,493	7,353,319
	Mastitis	6,683	433	2,846,717	44,677	2,891,394
Family Planning	Family Planning	51,282	151,598	7,625,070,690	149,146,740	7,774,217,430
STD	Genital Ulcer Disease	14,972	20,828	299,102,244	12,743,612	311,845,855
	Vaginal Discharge without pain	10,386	18,474	135,358,998	56,516,585	191,875,583
	Vaginal discharge with pain	4,324	10,746	44,497,252	1,972,482	46,469,734
			Total	9,954,706,791	1,220,135,023	11,174,841,814

Because caseloads for the districts were based on national caseloads, the relative proportion of costs for each condition is similar to the national level estimates. For example, family planning commodities made up the largest portion of total requirements, followed by basic antenatal care, clean and safe delivery, C-section, and genital ulcer disease.

Comparing total costs for the 11 districts using local and international prices

Total drug and supply costs for the 11 districts based on local and international prices were calculated and the results are shown in Table 7.

Table 7. Estimated total drug and supply costs in 11 districts based on international and local commodity prices (in US$)

Treatment type	Health problem/Condition	Int'l Prices	Local Prices
Antenatal Care	Basic Antenatal Care	413,262	599,616
	Antenatal Treatment	115,100	77,444
Deliveries	Clean and safe delivery	76,802	190,152
	Lacerations and Episiotomy	14,997	28,030
	Caesarian Section	101,613	123,660
Postnatal Care	Haemorrhage	7,673	10,282
	Puerperal Sepsis	25,331	62,463
	Neonatal Sepsis	1,513	2,828
	Mastitis	498	1,112
STD	Genital Ulcer Disease	55,971	119,941
	Vaginal Discharge without pain	440,725	73,798
		1,253,486	1,289,326

Medical Equipment Packages

As mentioned in the Methodology section, the CES team worked with local experts to define three basic equipment packages for this assessment. These were basic antenatal care, clean and safe delivery, and obstetric surgery. The total cost of each package are presented below, followed by a discussion of the total equipment requirements for Zambia and for the 11 districts studied.

Basic antenatal care

The equipment package and local and international prices are given in Annex E. There were a few items for which local or international prices were not available, including gestational wheel and ultrasound machine. These were included as recommended additional items. Therefore, the cost of the basic antenatal care package using local and international prices was estimated as follows:

Local prices 7,410,096 Kwacha ($2,850)
International prices $3,057

Local and international prices of the package seem comparable. Since local and international prices for potentially expensive items (e.g., ultrasound machine) are not available, this estimate is not complete. However, the decision on whether an ultrasound machine is appropriate at the lowest level of care must be made based not only on costs but also on the training and skill of health care providers at health facilities.

Clean and safe delivery package

The content and the number of items included in the clean and safe delivery equipment package is shown in Annex E. Excluding those items whose prices were not available, cost per package is estimated to be—

Local prices 5,626,350 Kwacha ($2,136)
International prices $2,300

As with the ANC equipment package, the prices for the same list of items were comparable. However, there were several key items that were missing international prices, including autoclave, sterilizer, and trolley. The local prices for these items were available. The total equipment package cost including these items was 27,750,549 Kwacha ($ 10,673) in local prices.

Obstetric surgery equipment package

Annex E presents the items and prices that make up the obstetrics surgical equipment package. Certain local and/or international prices were not available (some surgical instruments, gowns, trolley, etc). Comparing items with both local and international prices available, the cost per package was estimated as—

Local prices 5,561,280 Kwacha ($2138)
International prices $698

The difference in the prices is attributable to several items in the package whose international prices were significantly lower than that of local ones (e.g., forceps, scissors, and suction machine).

It is possible to look at the total cost of the package using all prices available, though there were many items for which local prices but not international prices were available, and vice versa (see Annex E for the complete list). Using all available local prices, the local cost per package was estimated as about 15 million Kwacha ($5,800). Using all available international prices, the total package cost was estimated to be $1,471. Note that there were many expensive items without international prices (e.g., retractor).

Overall requirements for providing RH equipment

The number of health facilities in Zambia and in the 11 districts was used as the basis for estimating overall medical equipment requirements. Here the requirements are calculated as if all equipment at all facilities will be totally upgraded. The survey data yields equipment availability information, and this is combined with the equipment estimates later in the report.

Tables 8 and 9 present the estimated total equipment package requirement at all facilities in Zambia and in the 11 districts. Hospitals are divided into three groups by level, namely central hospitals, general hospitals, and district and mission hospitals, as the their infrastructure and service capabilities are different. For each type of hospital and health center, the study team in consultation with local experts decided the number of equipment packages necessary. Tables 8 and 9 show the equipment needs by type of facility, as well as the total number of each equipment package needed nationally.

Table 8. National equipment package requirements by type of facility (0 if not offered)

Type of facility	Total number of facilities	Equipment packages needed per facility		
		Antenatal care	Clean and safe delivery	OB surgery
Health centers	1,084	1	1	0
Central hospital	3	5	5	5
General hospital	9	3	2	2
District hospital	54	2	1	1
Total number of each package		**1,234**	**1,171**	**87**

Table 9. Equipment package requirements by type of facility in 11 districts (0 if not offered)

Type of facility	Total number of facilities	Equipment packages needed per facility		
		Antenatal care	Clean and safe delivery	OB surgery
Health centers	230	1	1	0
Central hospital	2	5	5	5
General hospital	4	3	2	2
District hospital	11	2	1	1
Total number of each package		**274**	**259**	**29**

The total number of equipment packages and their unit prices were used to calculate the total costs to upgrade medical equipment at all facilities at national level and in the 11 districts. Tables 10 and 11 below present the calculations. They show, for example, how many antenatal care equipment packages are needed nationally and in the 11 districts studied, and how much it is estimated that it would cost to provide them.

Table 10. Total costs for medical equipment for all health facilities in Zambia

Type of Equipment Package	Total Number Needed	Total Costs		
		Local Price (Kwacha)	Local Price ($)	International Price ($)
Basic ANC	1,234	9,144,058,000	3,517,000	3,773,000
Clean and safe delivery	1,171	31,070,276,000	11,950,000	2,368,000
OB Surgery	87	1,303,392,000	501,000	128,000
Total		41,517,726,000	15,968,000	6,268,000

Table 11. Total costs for medical equipment for all health facilities in the 11 districts

Type of Equipment Package	Total Number Needed	Total Costs		
		Local Price (Kwacha)	Local Price ($)	International Price ($)
Basic ANC	274	2,030,366,000	780,900	837,700
Clean and safe delivery	259	6,872,076,000	2,643,100	523,700
OB Surgery	29	434,464,000	167,100	42,700
Total		9,336,907,000	3,591,100	1,404,000

As discussed in the previous section, the price information is not complete for all packages. In particular, there are a number of expensive items whose international prices are not available. Thus, total estimated costs, especially for international prices, should be applied cautiously.

The CES data collection team visited 153 facilities in 11 districts. The 153 facilities were composed of 139 health centers and 14 hospitals. The data collection tools used were retrospective through record reviews and prospective through observation and interviews of women and health personnel at the clinics. Specifically, data collectors used the following survey forms mentioned in the methodology section:

- Health Facility Survey Form
- Health Care Provider Questionnaire
- Mother Interview Form

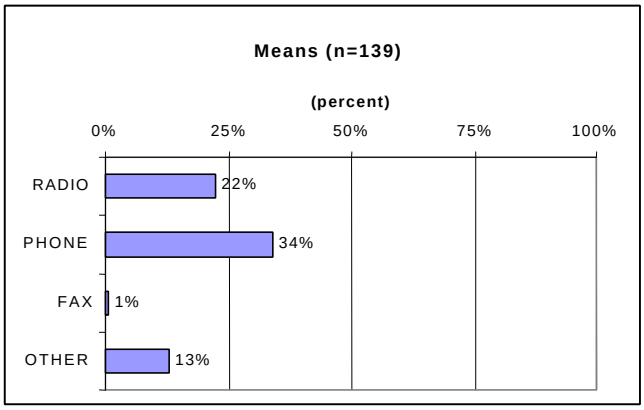
The results of each survey are presented in separate chapters. This chapter details the results of the health facility survey, which begins with a review of the services available at health centers and hospitals. Next there is a discussion of the availability of drugs, supplies, and medical equipment.

General services provided by health facilities

Communication facilities at health centers

Many health centers surveyed do not have means for effective communication, such as telephone, radio, and fax machine that enable them to contact referral facilities for emergency cases. (Figure 5)

Figure 5. Health centers with functioning communication means



- Fifty-nine health centers (42.4%) visited by the survey team had no modern communication facility available at the time of the survey.
- Twenty two percent of health centers had radio and 34% had telephone.
- Thirteen percent of them had other means of communication, such as messengers and bicycle.

Considering the fact that the survey did not cover facilities in the most remote areas, an overall availability of communication tools for health centers for emergency cases may be worse than what these results suggest.

Transportation at health centers

Although 91 percent of health centers had some means of transporting patients in cases of emergency, these options were limited or unreliable (Figure 6). The disparity in transportation opportunities was significant between urban and rural health centers (Figure 7).

- More urban health centers (41 %) have access to an ambulance than do rural health centers (19%).

- Some rural facilities use more primitive and slower means of transportation such as ox-cart, bicycle, and canoe.

- In addition, 9 percent of rural health centers that the survey teams were able to access did not have any means of emergency transportation, while only 2% of urban health centers were found to have the same limitation.

It is likely that the rural centers in remote locations that the survey team was unable to visit are faced with more severe transportation limitations, both in terms of the availability of transportation and the distance traveled to reach the nearest facility.

Figure 6. Health centers with transportation

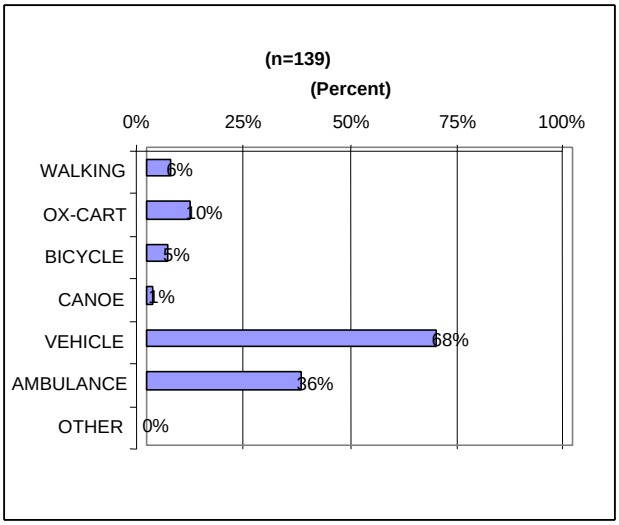
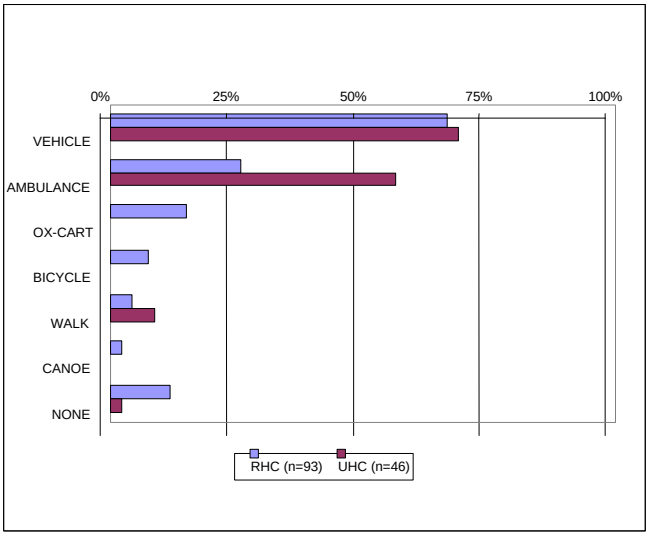
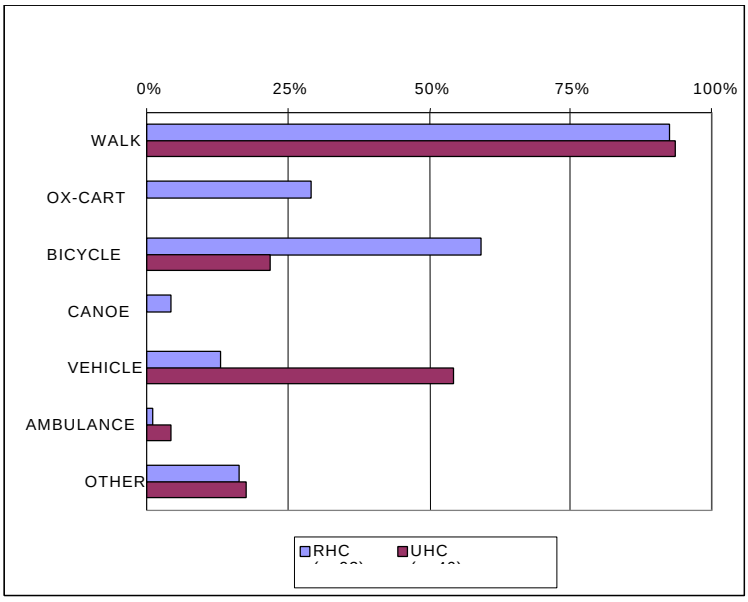


Figure 7. Types of emergency transportation available at health centers



Accessibility by women

Figure 8. Means of travel for women coming to health centers



The survey data show that on average the distance that a woman has to travel to reach the nearest health center in urban areas is 11.0 km, while women in rural areas travel 26.9 km on average.

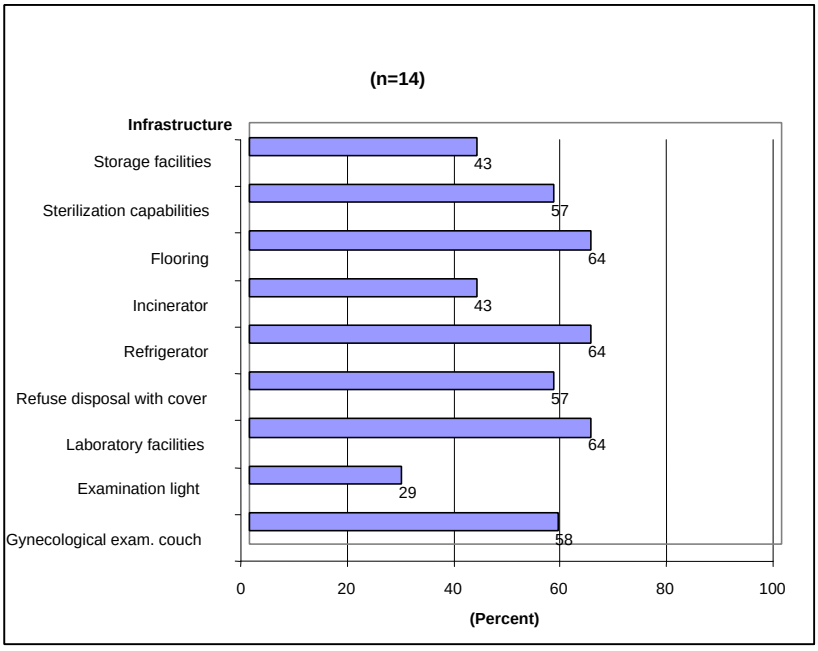
Figure 8 shows the various modes of transportation used by women coming to health centers in rural and urban areas. While walking to health facilities is the most common way for women to reach rural and urban health centers, vehicles are more often used by women in urban areas (54%) than by women in rural areas (13%).

As in the case of emergency transportation, the use of bicycle, canoe, and ox-cart is more frequent means of transportation for women in rural areas. In addition to the longer distance to health facilities, women in rural areas are likely further limited by the lack of access to effective means of transportation compared to women in urban areas, demonstrated previously in Figure 7.

Basic infrastructure

At hospitals

Figure 9. Basic infrastructure in satisfactory condition at hospitals

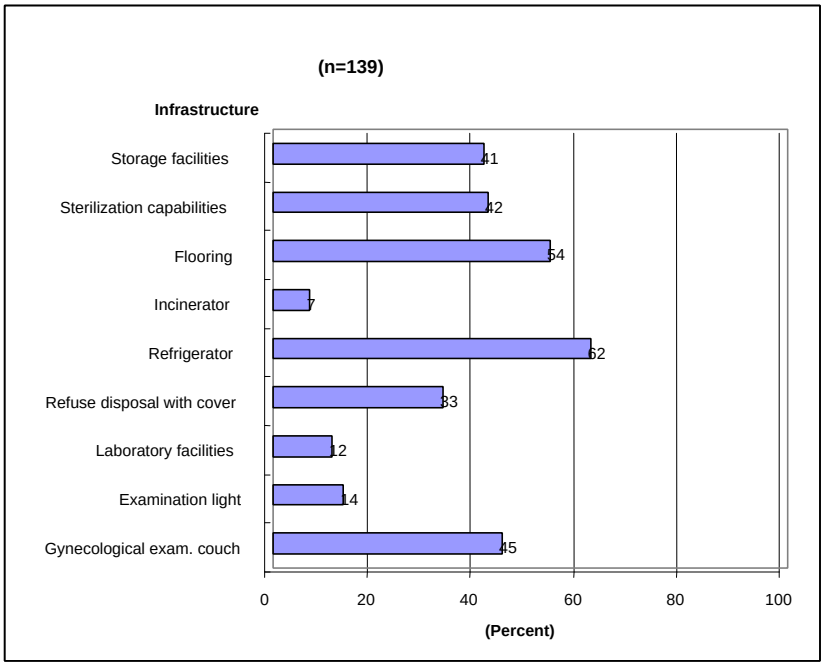


Approximately one-third of hospitals do not have a functioning refrigerator or proper sterilization capabilities; both are critical for ensuring minimum quality of care and conducting basic laboratory tests. One serious concern is the lack of a proper refuse disposal and incinerators (57% and 43%, respectively) in hospitals (see Figure 9). This finding demonstrates a potential lack of infection controls at these facilities.

At health centers

Infrastructure problems seem to be greater at health centers than hospitals. Only 12 percent of centers surveyed have laboratory facilities that are in satisfactory condition (see Figure 10). Ninety-three percent of health centers do not have an incinerator, and two-thirds of centers do not have refuse disposal with proper cover. Relatively high availability of refrigerators compared with other items may be a result of polio eradication activities. Fifty-eight percent of health centers do not have sterilization capabilities.

Figure 10. Basic infrastructure in satisfactory condition at health centers



Availability of medical records

Functioning medical information system is a key to the quality reproductive health care and efficient management of health care system. Appropriately designed record forms can facilitate proper health management information systems that monitor morbidity, needs, and level of coverage, among others. The availability of medical cards and registers was checked at surveyed facilities. The study found that medical records were often inadequate.

Medical cards

First, the survey examined whether or not the following four medical cards, the main types of cards used in Zambia, were available at facilities. Each of these cards are created for individual patients and stored at the facility:

- Family planning card
- Antenatal care card
- Partogram
- Children card

Figure 11. Availability of medical cards for patients in facilities

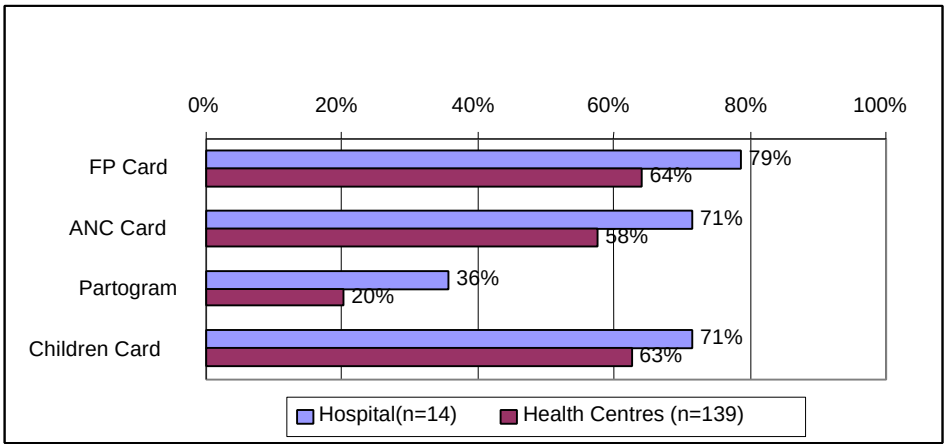


Figure 11 demonstrates the use of medical cards in hospitals and health centers. The findings are as follows—

- All four forms were more available at hospitals than health centers. Given the importance of health centers in providing basic services such as outpatient antenatal care, the low stock level of these key record forms deserves urgent attention.

- Partograms were not available at more than 60% of hospitals and 80% of health centers. The use of partograms promotes appropriate pregnancy management and it should be widely available, especially at health centers.

Registration books

Another group of forms whose availability was examined in the survey was registration books. For purposes of this study, medical records included—

- Admission Book
- Family planning register
- Children register
- ANC register
- Delivery register
- OB surgery register
- Report form

The results of this review are found in Figure 12.

Figure 12. Availability of registers in facilities

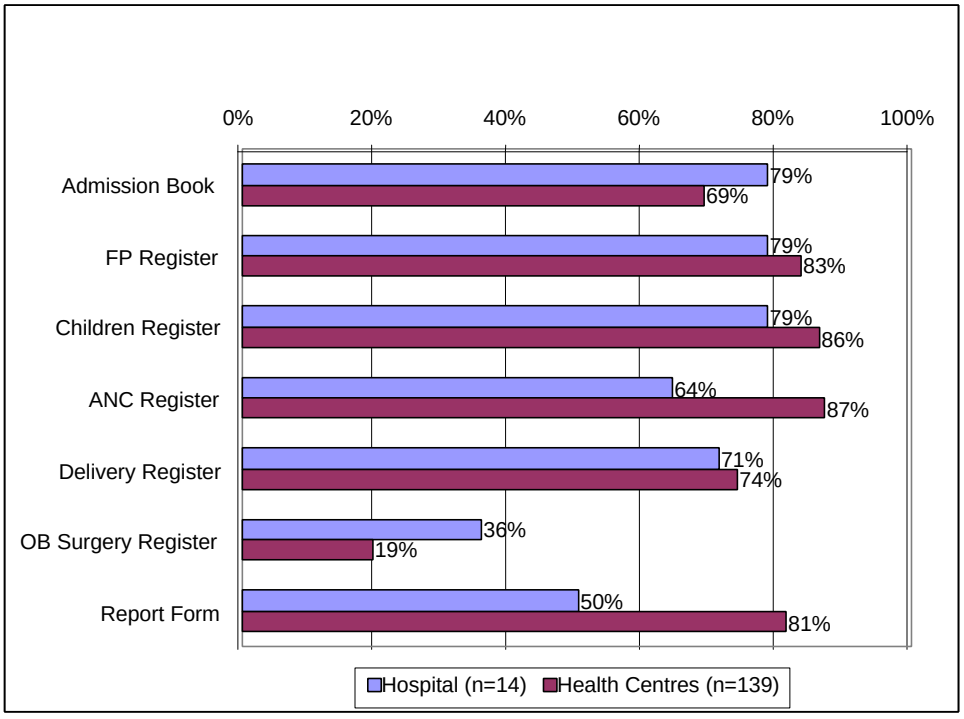


Figure 12 reveals that

- On the whole, these seven registration books were available at most of hospitals and health centers, with the exception of the OB surgery register.

- Unlike individual patient forms, availability of five registration books (i.e., family planning, children, ANC, delivery books, and report form) was higher at health centers than hospitals. This may suggest that health centers rely more on registration books than on individual patient forms.

Figures 13 and 14 show the combined availability of individual patient cards and registers. The pattern of availability is similar at both the hospital and health center level. In particular, about 30% of hospitals and health centers did not have 1 or 2 forms. In addition, about 45 percent of both hospitals and health centers were missing 3 to 5 forms.

Figure 13. Availability of key medical record forms at 14 hospitals

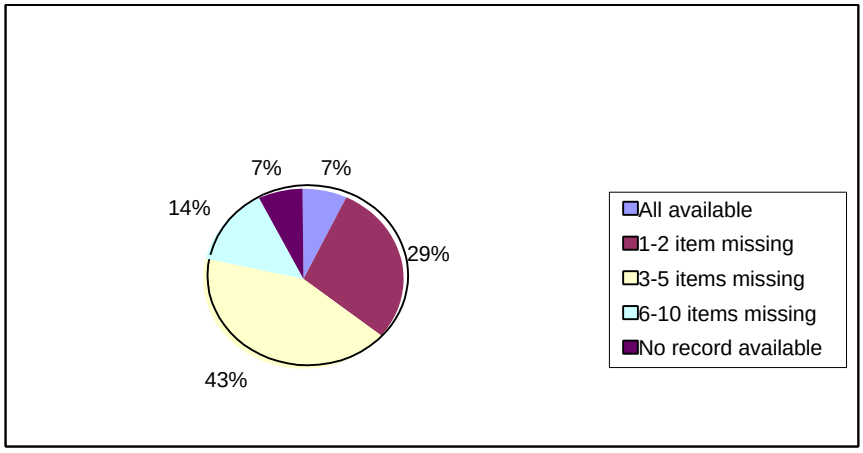
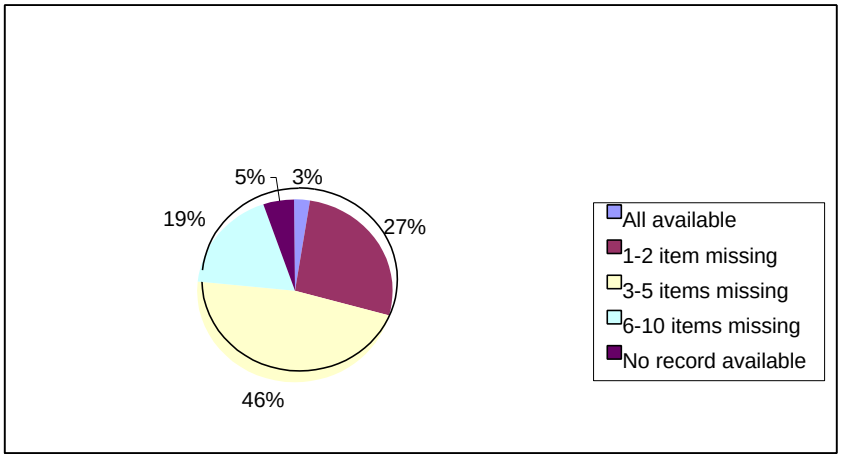


Figure 14. Availability of key medical record forms at 139 health centers

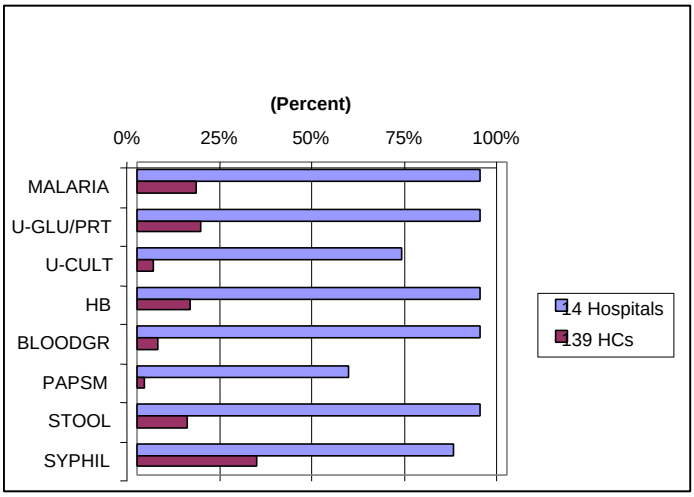


General RH services provided at health facilities

Laboratory tests

The survey checked for eight regular RH laboratory tests: malaria, urinalysis (for glucose and protein), hemoglobin, blood typing and Rh cross match, Pap smear, stool test for ova and parasites, and syphilis. Figure 15 presents the percent of facilities that conduct these tests.

Figure 15. Laboratory tests conducted at facilities



At hospitals

- Only one hospital reported regular testing for all of these conditions.
- Twelve hospitals (86%) conduct syphilis screening.
- Among types of laboratory tests assessed in the survey, urine culture and sensitivity test, and Pap smear were performed at fewer hospitals: 10 (71%) and 8 (57%) hospitals stated that they performed these tests respectively.

At health centers

- Less than 20 percent of 139 health centers visited performed the laboratory tests
- 32 percent of health centers reported syphilis screening

The Ministry of Health National Health Strategic Plan for 1998-2000 states laboratory diagnosis of malaria, urinary tract infections, pelvic inflammatory disease, and parasites, among others, as part of the "Health Center Package." Given the new policy, the rates of laboratory testing reported by health facilities are low.

Integrated services

The same policy mentioned above also promotes integrated services for RH care. For example, if a woman comes in for antenatal care, she is checked for other conditions also. The data collectors attempted to ascertain if facilities provided integrated care. Whether or not reproductive health services are integrated was defined in the survey if clients have access to any of these services at any time when the facility is open. Sixty-four percent of 14 hospitals and 48% of 139 health centers responded that the provision of all reproductive health services, namely family planning, basic antenatal care and treatment, STIs, nutrition, Pap smear, and child health, are integrated at their facilities.

Availability of emergency maternity services

All but one hospital surveyed (93%) responded that they provide maternity emergency services for 24 hours including weekends and public holidays. At health center level, the rate was lower: 110 health centers (79% of 139 health centers in the survey) stated that they provide the 24 hour maternity emergency services.

Drug availability

Drug availability is directly linked to patient treatment. When drugs are not available, it can limit health care practitioners' ability to effectively treat a patient's condition. The CES survey aimed to gather key information on drug availability in the 11 districts surveyed.

The team used the standard treatment guidelines developed for the cost estimates (see methodology) as a basis for reviewing drug availability in the 11 districts. Data collectors checked the availability of the standard drugs stipulated for each condition.

The following discussion presents the findings on drug availability for basic antenatal care, clean and safe delivery, sexually transmitted infections, and cesarean section. In addition, there are some findings on the availability of intravenous fluids, which were included in this study for their role in treating a number of RH conditions. This section ends with a review of stock out days per month in the surveyed facilities.

Basic ANC drugs

Observed patterns of availability of drugs for basic antenatal care, including chloroquine, ferrous sulfate, folic acid, and mebendazole) were similar at health centers and hospitals (Figure 16).

Table 12 also illustrates the average stock level of the four basic ANC drugs. Average stock level was calculated as the median number of tablets at facilities where they were in stock.

Figure 16. Percent of facilities with basic ANC drugs in stock

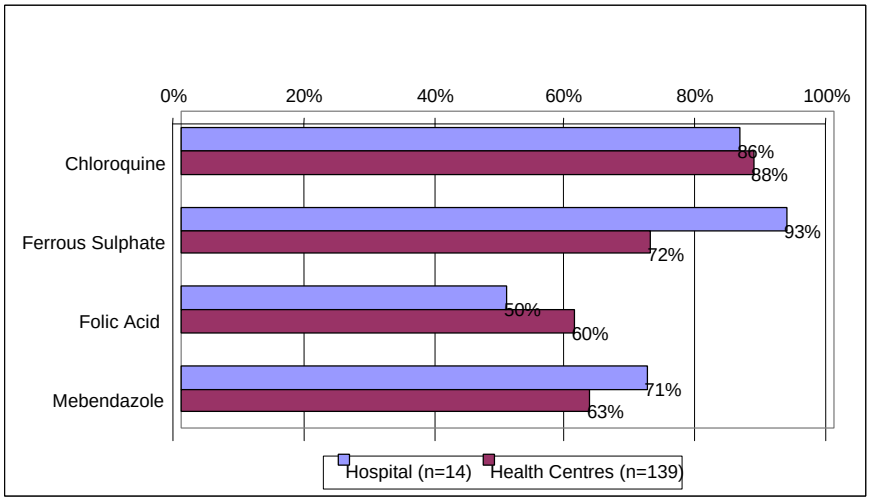


Table 12. Average stock level of basic ANC drugs at facilities

	Chloroquine	Ferrous sulfate	Folic acid	Mebendazole
Hospitals	6,500	17,000	1,000	3,500
Health Centers	5,350	3,000	5,250	900

These results show that—

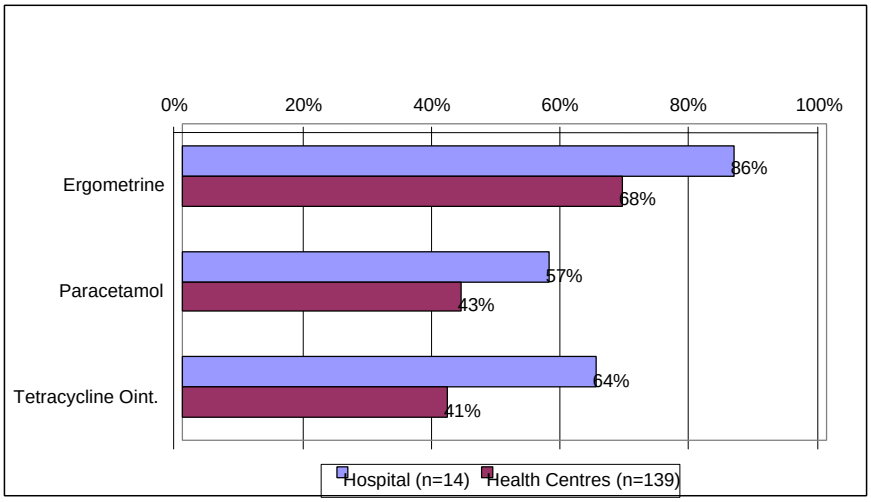
- Most facilities had the four basic ANC drugs available.

- Most hospitals (86%) and health centers (88%) had chloroquine in stock at the time of the survey.
- Ferrous sulfate was generally more available than folic acid at both types of facilities.
- Folic acid was out of stock at half of hospitals and 40% of health centers surveyed.
- One-quarter of health centers did not have ferrous sulfate.
- Mebendazole was not available at 30% of hospitals and one-third of health centers.

Drugs for clean and safe delivery

Ergometrine, paracetamol, and tetracycline eye ointment were chosen for the clean and safe delivery STGs in Zambia. Survey results (see Figure 17) indicate that they were not available at a majority of health centers and some hospitals. At the time of the survey, for example, ergometrine was out of stock at nearly one-third of all health centers.

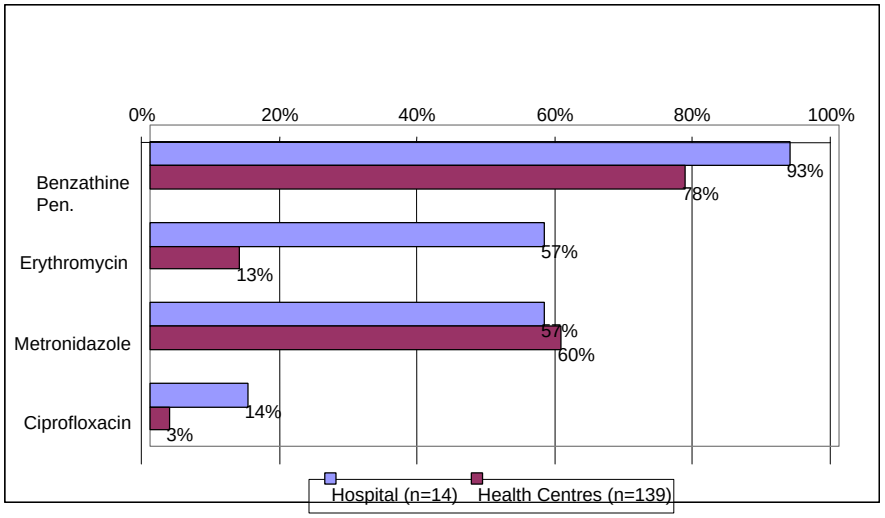
Figure 17. Percent of facilities with clean and safe delivery drugs in stock



Drugs for sexually transmitted infections

Four drugs, benzathine penicillin, erythromycin, metronidazole, and ciprofloxacin, were included in the treatment protocols for the three sexually transmissible infections (genital ulcer disease, vaginal discharge with pain, and vaginal discharge without pain)included in the assessment. The results appear in Figure 18 and are discussed below.

Figure 18. Percent of facilities with STI drugs in stock



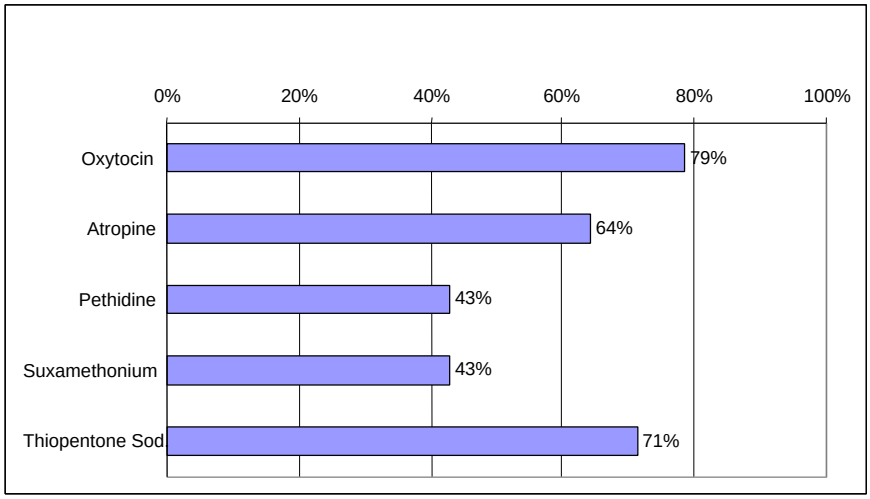
- As much as 97 percent of health centers and 86 percent of hospitals lacked ciprofloxacin.
- Benzathine penicillin was in stock at 93 percent of hospitals and 78 percent of health centers.
- Erythromycin was out of stock at nearly half of hospitals and 87 percent of health centers.
- Metronidazole was out of stock at 53 percent of hospitals and 40 percent of health centers. .

Drugs for C-section

The availability of five key drugs included in the recommended treatment guidelines for C-section was examined at hospitals. The results are shown in Figure 19.

Two hospitals (1 district hospital and 1 mission hospital) had none of the recommended drugs in stock.

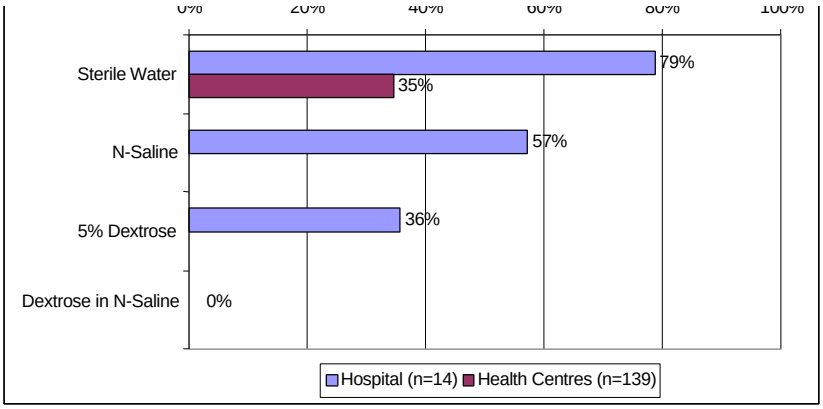
Figure 19. Percent of hospitals with C-section drugs in stock



IV fluids

In view of the importance of IV fluids in the treatment of a number of reproductive health conditions, such as C-section, puerperal sepsis, and neonatal sepsis, data collectors reviewed the availability of IV fluids in health facilities (Figure 20). They observed very low stock levels of all four IV fluids checked, especially at health centers. Sterile water was the only IV fluid available at the health centers surveyed, however, it was only present at 35 percent of health centers. Hospitals had higher stocks of sterile water though, like health centers, they had very limited stocks of all other fluids reviewed.

Figure 20. Availability of IV fluids



Stock out

The availability data above measured the presence or absence of items at the time of survey. One-time spot check methods such as this cannot capture possible changes in the stock level over a longer period of time. Stock levels can be affected by a number of factors, which might have coincided with the timing of the survey.

In order to capture the stock level over a period of time, a retrospective review of commodity stock-out days per month was conducted in this assessment. For the purpose of this study, stock-out days refers to the number of days per month when a particular item was completely out of stock. The smaller the number of stock-out days, the better the availability of the item.

The average number of stock-out days per month over the past 6 months was calculated and the results for hospitals and health centers are summarized in Figures 21 and 22, respectively. Stock records were not available at a number of facilities, and the number of facilities with data at hand is indicated for each drug item reviewed.

Figure 21. Average drug stock-out days per month in previous 6 months at hospitals (n= number of facilities where records were available)

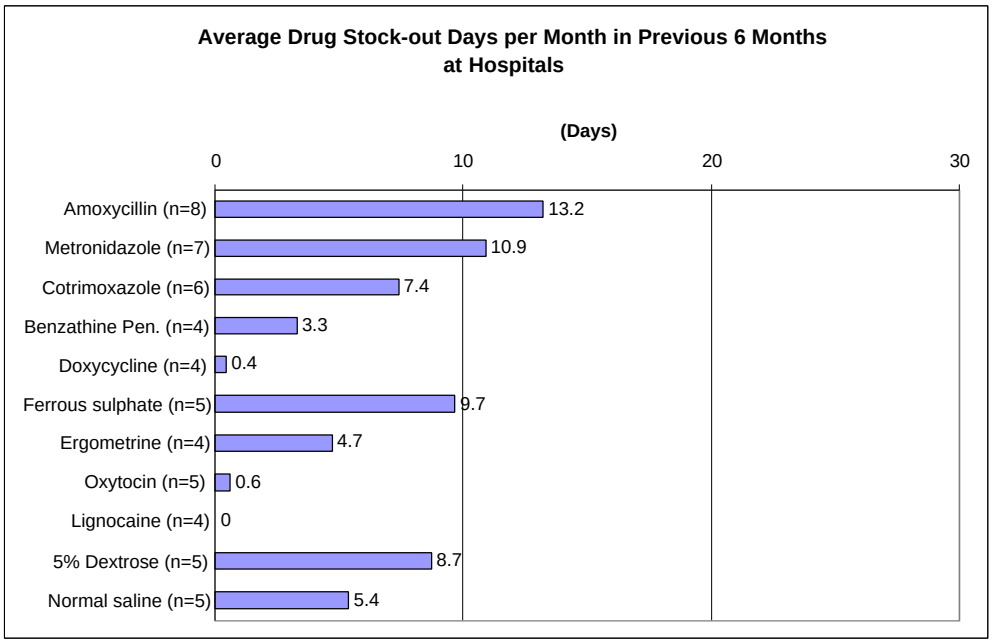
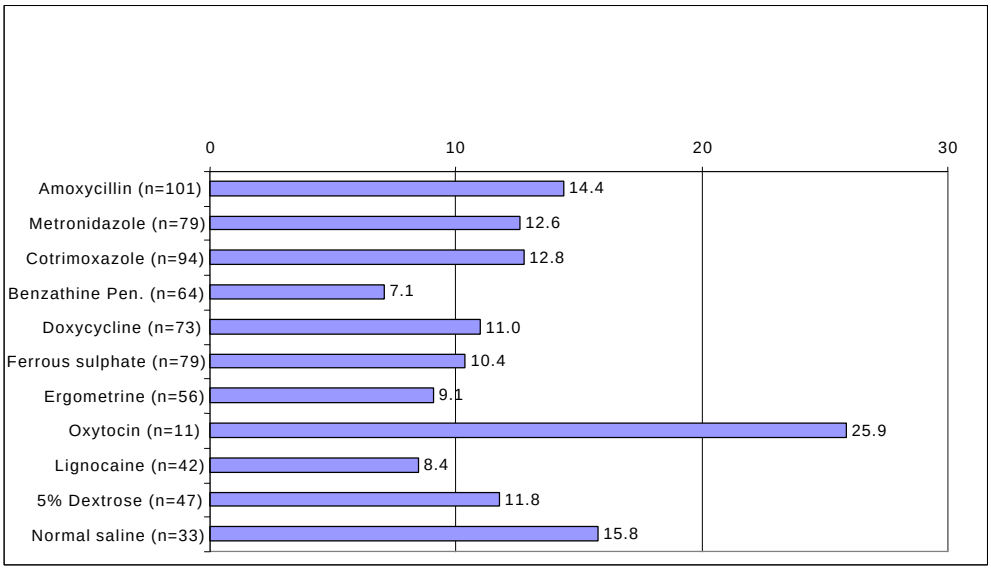


Figure 22. Average drug stock-out days per month in previous 6 months at health centers (n= number of facilities where records were available)



Figures 21 and 22 reveal that—

- Stocks of key reproductive health drugs were generally better at hospitals than at health centers.
- At hospitals, basic antimicrobial drugs such as amoxycillin, metronidazole, and cotrimoxazole were frequently out of stock.
- The finding that ferrous sulfate was out of stock for an average of 10 days per month at hospitals seems to conflict with the high availability level of this drug at the time of the survey (see Figure 12). There are two factors that contributed to the gap observed between these two assessments:

    - Those hospitals where ferrous sulfate was available at the time of the survey tended not to have the stock records.
    - There was one central hospital out of five with stock records where ferrous sulfate was constantly absent.
- Average stock-out days of IV fluids (normal saline and 5% dextrose) are very high, especially for the hospital level, where cases requiring these items are referred from lower level facilities.
- At health centers, most of the all drugs reviewed were out of stock for at least one third of the time, indicating that the absence of key drugs is a chronic situation for many of these facilities.

Medical supply availability

Medical supplies also play an important role in patient treatment. When drugs are not available, it can limit health care practitioners' ability to effectively treat a patient's condition. For example, if a facility lacks syringes, it is not possible to administer injections, even when the drug is available.

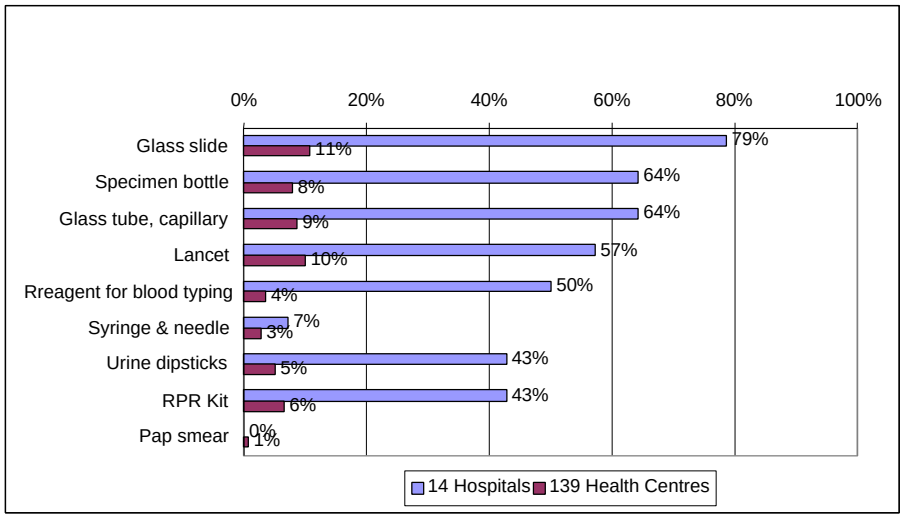
As with the study of drug availability, data collectors used the standard treatment guidelines developed for the cost estimates (see methodology) as a basis for reviewing medical supply availability in the 11 districts. Data collectors checked the availability of the standard medical supplies stipulated for each condition.

The following discussion presents the findings on medical supply availability for basic antenatal care, clean and safe delivery, and family planning in the 11 districts. There is an additional section on the availability of syringes, which are needed for treating a variety of conditions.

Availability of supplies for basic antenatal care

Availability of nine essential medical supplies for providing basic antenatal care, including laboratory tests, is summarized in Figure 23. Overall, the availability of supplies for basic ANC was extremely low, especially at health centers. The results are discussed in detail below.

Figure 23. Availability of supplies for basic ANC



Hospitals

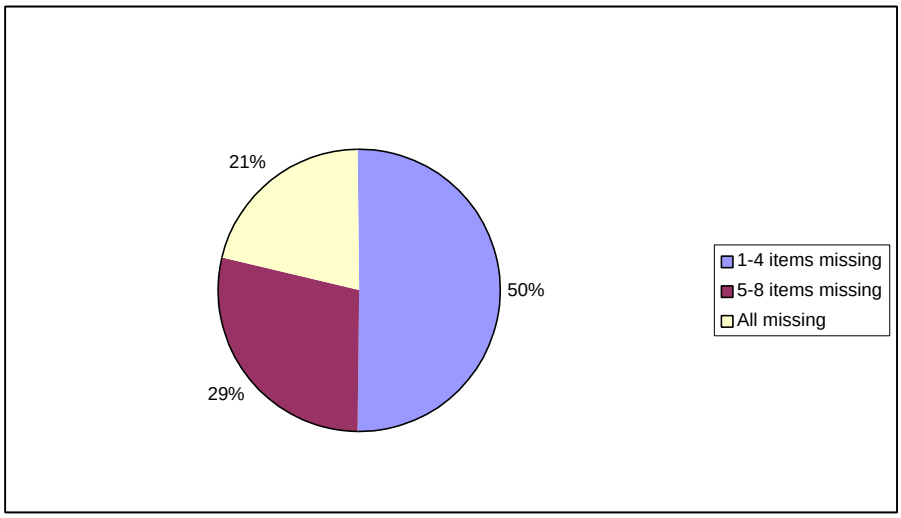
- There was evidence of severely low stocks of syringes and needles at hospitals, since only 7 percent of hospitals had syringes and needles in stock.
- Only four items were available at half of the hospitals or more. These items were glass slide (79%) for malaria parasite smear, specimen bottle (64%) for culture, capillary glass tube (64%) for blood typing, and lancet (57%) for hemoglobin test.
- Reagents for blood typing, urine dipsticks for urinalysis, RPR kits for syphilis screening were less available in hospitals.
- Pap smear supplies were not available at any hospitals

Health centers

- Medical supply availability was significantly lower at health centers than at hospitals. 89% of health centers lacked glass slides, for example. The other eight items included in the survey were lacking in 90 percent or more health centers.
- The syringe and needle supply in health centers was alarmingly low. Only 3 percent of health centers had syringes and needles in stock.
- Pap smear supplies were available at only 1 percent of health centers.

Figures 24 and 25 demonstrate the percent of facilities missing basic ANC medical supplies, excluding supplies for Pap smear.

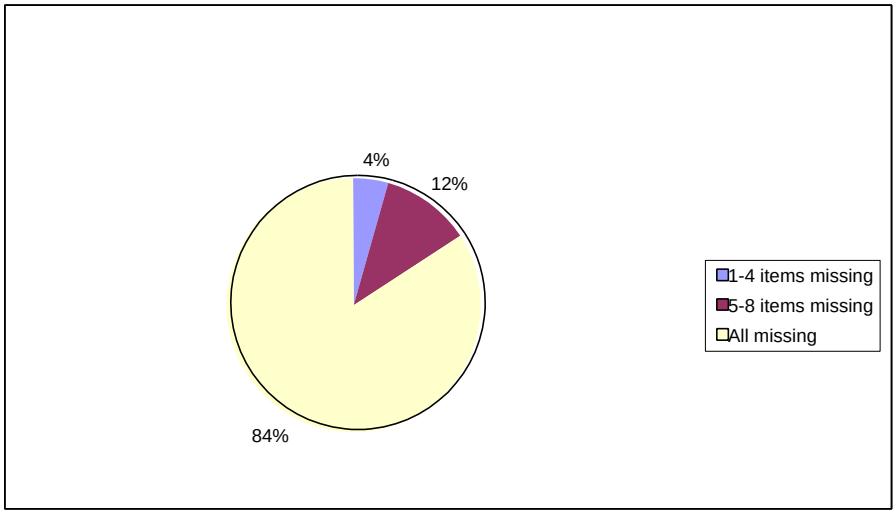
Figure 24. Number of basic ANC supply items missing at 14 hospitals



- Seven hospitals out of 14 did not have between 1 and 4 essential supply items required to provide basic antenatal service. There were three hospitals without any of 8 items examined at the time of the survey (one district hospital, one mission hospital and one general hospital). Another four hospitals lacked 5 to 8 supply items for basic antenatal care.

- The observed low availability of basic medical supplies for laboratory tests contradicts statements given by the majority of surveyed hospitals that they routinely conduct most key laboratory tests (see Figure 15). Many of the tests for pregnant women cannot be performed without the supplies included in the survey.

Figure 25. Number of basic ANC supply items missing at 139 health centers



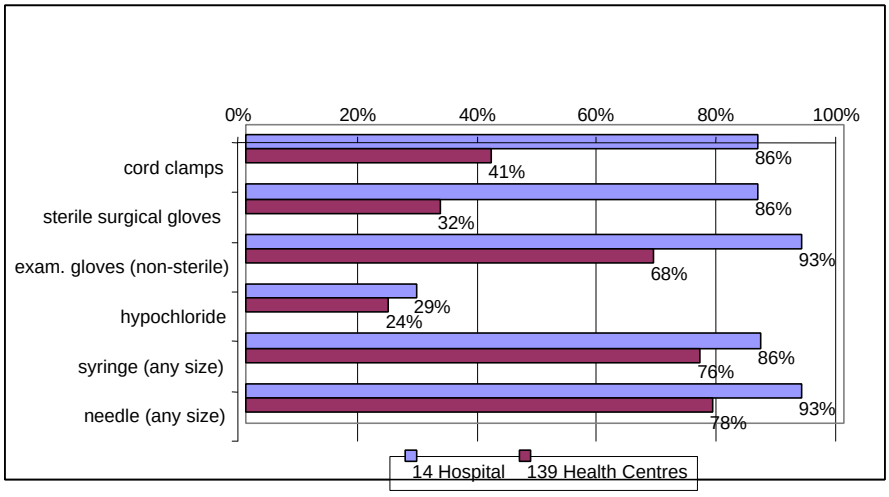
- The availability of medical supplies at health centers was extremely low. As show in Figure 23, none of the key items examined except glass slide (11%) was available at more than 10% of health centers visited by the data collectors. Figure 21 reveals that eighty four percent of the 139 health centers did not have any of these items at the time of the survey. Another 12% of them were without between 5 to 8 items.

- These low rates of medical supply availability support the low rates of routine laboratory tests reported by health center staff (see Figure 15). These findings indicate that the promotion of integrated reproductive health services needs to be supported by an improved commodity supply system, especially at the health center level.

Availability of supplies for clean and safe delivery

Data collectors checked the availability of six medical supply items, included in the treatment protocol for clean and safe delivery, at hospitals and health centers. The results are presented in Figure 26 and summarized below.

Figure 26. Percent of facilities with supplies for clean and safe delivery



Hospitals

- Most medical supply items were available at the majority of hospitals surveyed.

- There were a few hospitals where some very basic items, such as sterile and non-sterile gloves or syringe and needle, were not present at the time of the survey.
- Eleven of the 14 hospitals did not have hypochloride in stock.

Health centers

- Health centers reported lower availability of all clean and safe delivery supplies than did hospitals.
- More than two-third of health centers did not have a single pair of sterile gloves.
- One-third of health centers lacked non-sterile examination gloves.
- Cord clamps were found only at 41 percent of health centers.
- Hypochloride was out of stock at 76 percent of health centers.
- No needles or syringes of any size were found at 22 and 24 percent, respectively, of health centers.

Availability of family planning commodities

Figure 27. Percent of facilities with family planning supplies

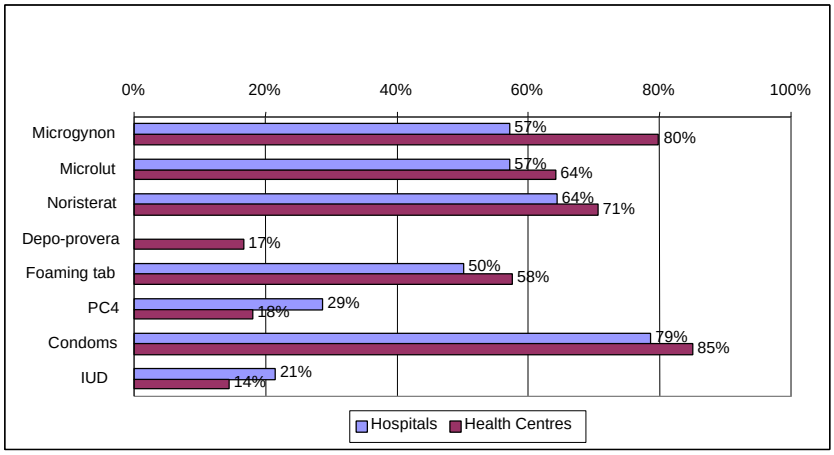
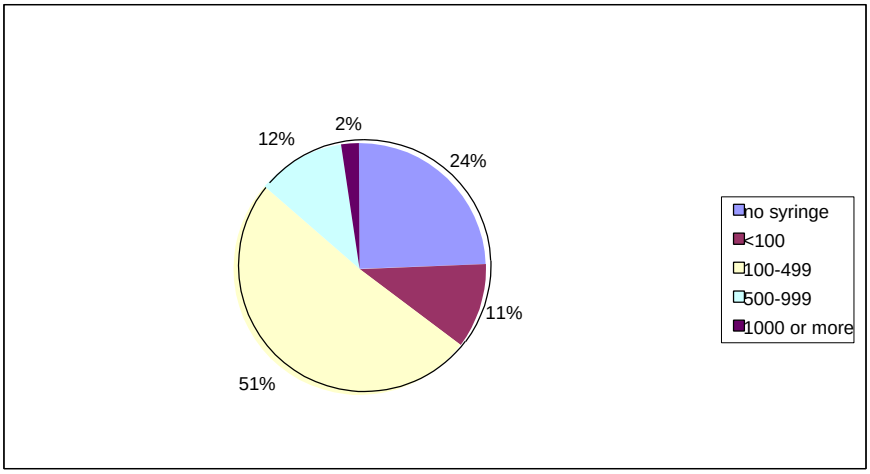


Figure 27 shows that the availability supplies for family planning was similar between hospitals and health centers. Unlike many other commodity items that were examined in this assessment, the availability of some family planning commodities (i.e., microgynon, microlut, noristerat, foaming tablets, and condoms) was slightly better at health centers than at hospitals. Though the national family planning policy requires that IUD be available to patients, this supply was not available at 79% of hospitals and 86% of health centers. Depo-provera was not available at any of the hospitals surveyed, and 83% of health centers did not have it in stock.

Syringe and needle availability

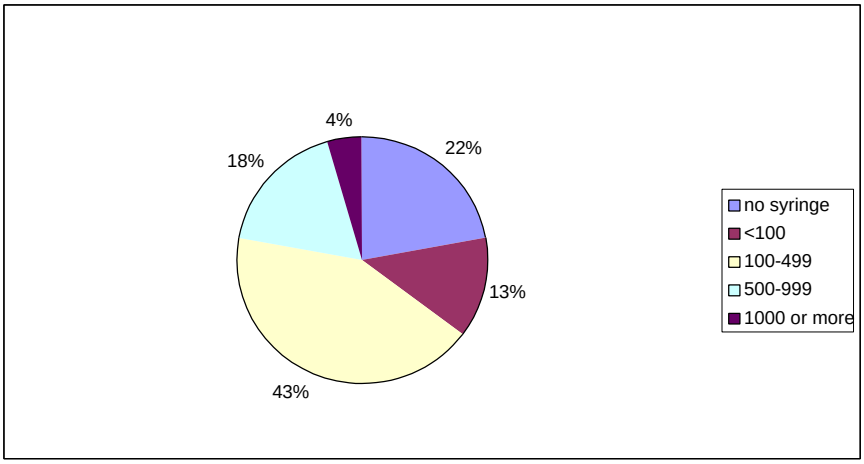
Because syringes and needles are such basic items for treating many reproductive health conditions, RPM further examined stock levels of these commodities at health centers. The use of sterile syringes and needles helps prevent disease transmission and protects the safety of patients visiting health centers. Data collectors recorded the number of syringes and needles available. Typically, syringes are provided in a box of 100 syringes. Figures 28 and 29 show the percentage of the 139 health centers with syringes and needles available.

Figure 28. Syringe availability at health centers



- As mentioned earlier, 24 percent of health centers had no syringes in stock.
- Eleven percent of health centers had fewer than 100 syringes in stock.
- 51 percent of health centers had 100 to 499 syringes in stock.
- Despite the fact that 76 percent of health centers had some syringes in stock, it can be seen from this analysis of the syringe availability data that stock levels were generally inadequate.

Figure 29. Needle availability at health centers



- The stock level of needles, in any size, was similar to that of syringes.
- Twenty-two percent of health centers had no needles in stock.
- Thirteen percent had fewer than 100 syringes in stock.
- Forty-three percent had between 100 and 499 syringes in stock.

The findings on the low availability of syringes and needles, coupled with the lack of proper sterilization facilities discuses in the general services section (see pages 44 and 45), suggest possible repeated use of disposable syringes and needles that are not properly disinfected. The lack of capacity to sterilize opens the possibility for opportunistic infections among health center patients.

Medical equipment availability

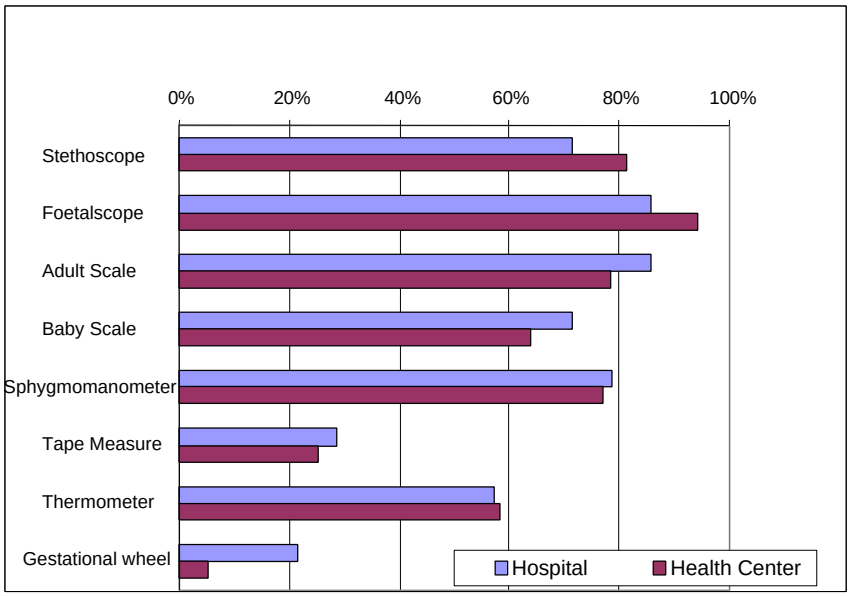
The CES survey gathered data to determine whether essential medical equipment items were actually available at facilities. Medical equipment needs were defined by the CES team (see methodology) for three equipment packages: basic antenatal care, clean and safe delivery, and obstetric surgery. Data collectors used the equipment packages to create a list of the basic items needed in facilities and then checked the availability of each item.

The following discussion presents the findings on medical equipment availability for basic antenatal care, clean and safe delivery, and obstetric surgery at the 14 hospitals and 139 health centers in the 11 districts surveyed.

Availability of basic ANC equipment

Figure 29 presents the percent of facilities with each of eight key basic ANC equipment items. The pattern of ANC equipment availability was similar between hospitals and health centers. Tape measurers and gestational wheels were not widely available at either type of facility. More than 40 percent of hospitals and health centers did not have single thermometer at the facility when the survey was conducted. Both types of facilities exhibited low availability of baby scales and stethoscopes, two very basic items for proper ANC.

Figure 29. Facilities with basic ANC equipment available



Hospitals

- No hospital had all ANC equipment items at the time of the survey.
- On average, three items were not available at hospitals.
- Four out of the 14 hospitals did not have a baby scale or stethoscope.

Health centers

- Only three of the 139 health centers (one in Kabwe District and two in Livingstone District), had all the basic antenatal care equipment. This means that almost 98 percent of health centers did not have the complete set of basic ANC equipment.
- On average, four items were not available at health centers.

Table 13 shows the average number available of each item, in addition to the percentage of facilities where the item was available. In general, even when items were available, the number of items was very low. This was especially the case at health centers.

Table 13. Percentage of facilities with basic ANC equipment and their average stock level

Basic ANC Equipment	Hospital (n=14)		Health Centre (n=139)	
	% of Facilities Available	Average Number Available	% of Facilities Available	Average Number Available
Stethoscope	71%	2.6	81%	1.4
Foetalscope	86%	3.8	94%	2.5
Adult Scale	86%	2.5	78%	1.4
Baby Scale	71%	1.6	64%	1.2
Sphygmomanometer	79%	2.5	77%	1.3
Tape Measure	29%	1.8	25%	1.2
Thermometer	57%	5.9	58%	2.3
Gestational wheel	21%	2.0	5%	1.3

Availability of clean and safe delivery equipment

Forty equipment items were included in the clean and safe delivery equipment package developed for the assessment. The survey examined the availability of 28 of the items at hospitals and health centers. Figures 30 and 31 show the availability levels of each item at the two types of facilities.

Figure 30. Percent of 14 hospitals with clean and safe delivery equipment

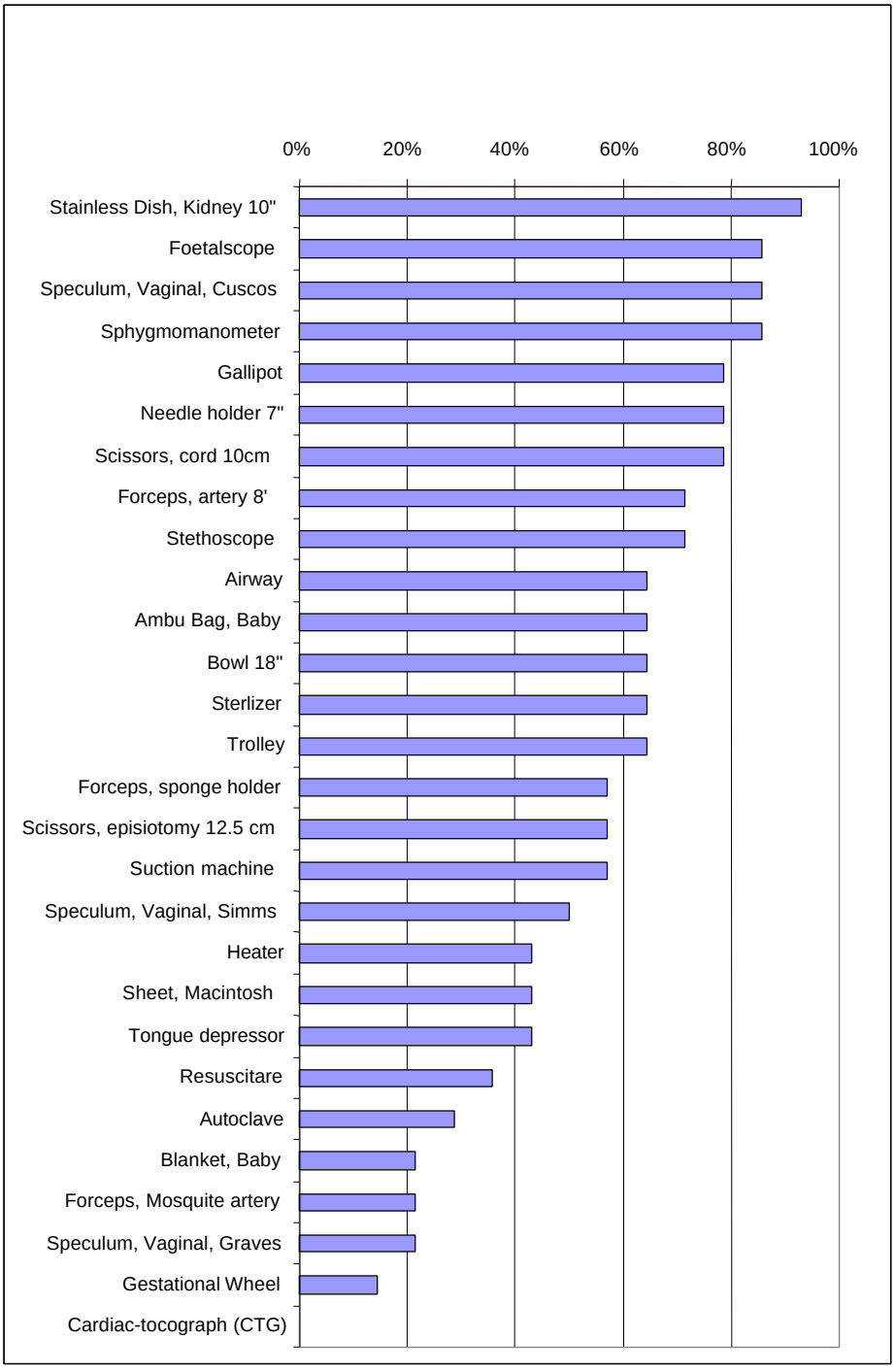
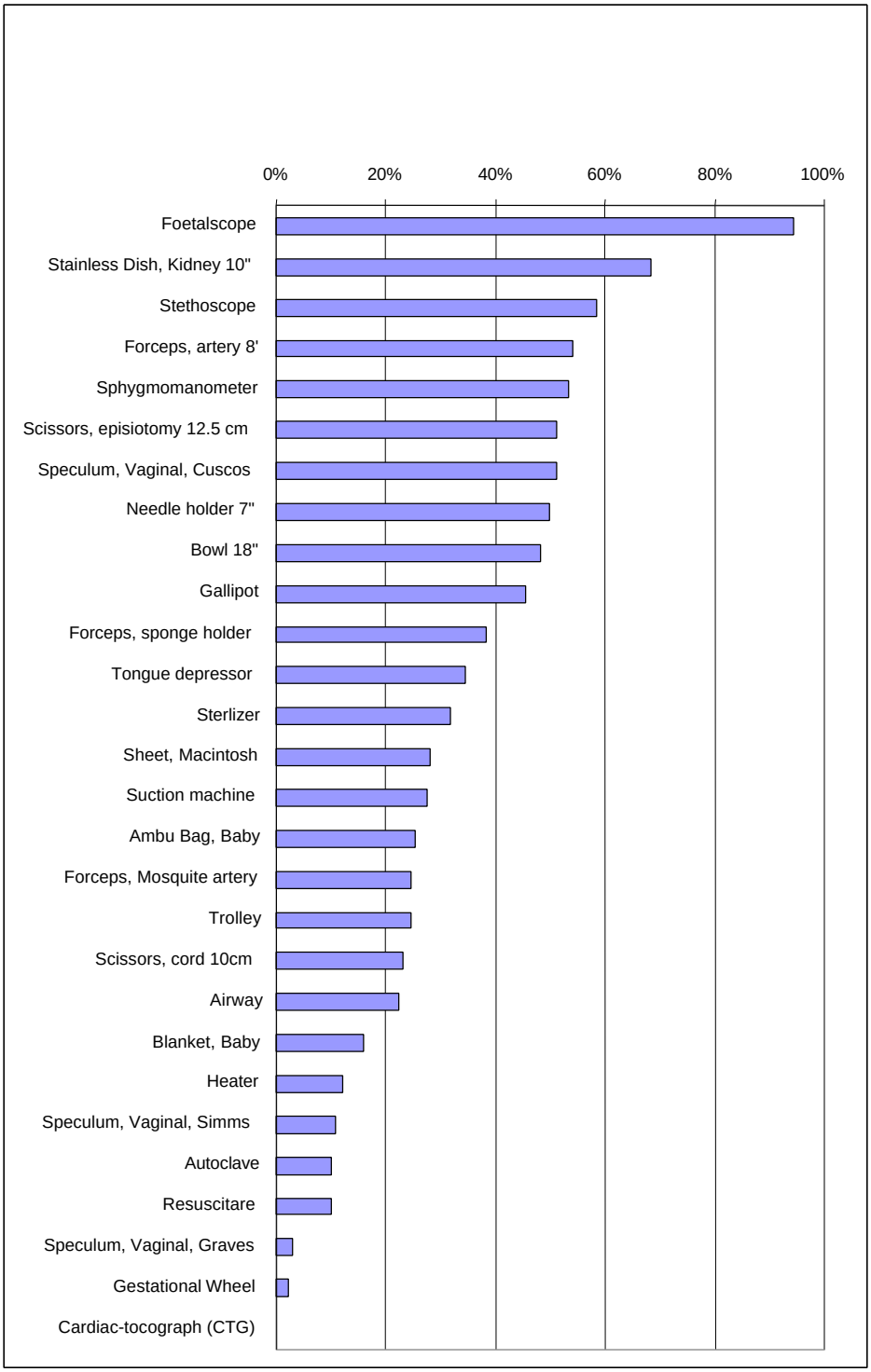


Figure 30 shows that many basic medical equipment items necessary for labor and delivery were not available at some hospitals. Out of the 28 items included in the survey, only 4 items (kidney dish, foetalscope, vaginal speculum, and sphygmomanometer) were found at more than 80% of hospitals.

Figure 31. Percent of 139 health centers with clean and safe delivery equipment



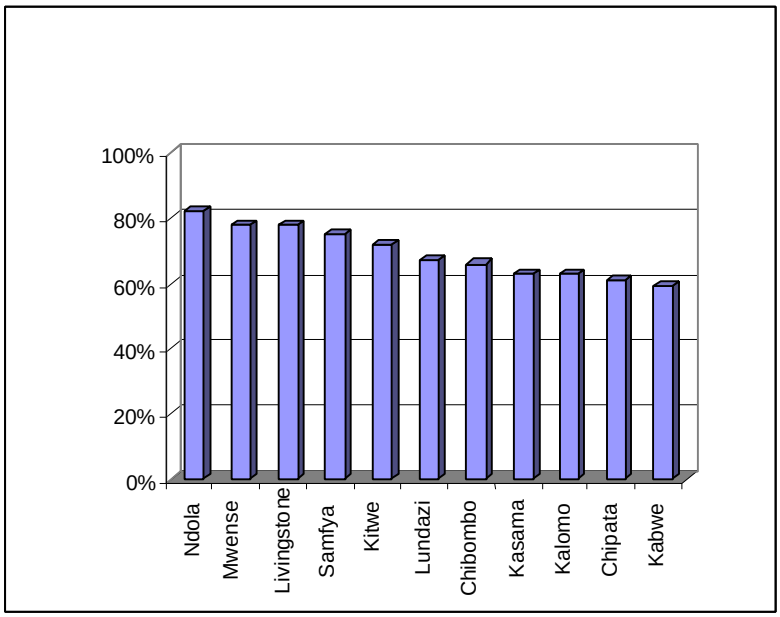
The lack of essential medical equipment for clean and safe delivery was more serious at health centers than at hospitals. Seventeen of the 28 items included in the survey were missing at 60 percent or more health centers.

Clean and safe delivery equipment availability by district

To further examine the clean and safe delivery equipment availability data for health centers, RPM desegregated the data by district.

Figure 32 summarizes the average percentage of 28 medical equipment items for labor delivery that was missing at facilities in each district. Ndola district had the greatest number of clean and safe delivery items missing. There, on average, 80 percent of items were unavailable at health centers. The levels reported by health centers in other districts, though better, were still quite low. For example, Kabwe district, which had the lowest level of missing items among the 11 districts, lacked almost 60 percent of clean and safe delivery equipment items.

Figure 32. Average percent of clean and safe delivery equipment items missing at health centers, by district



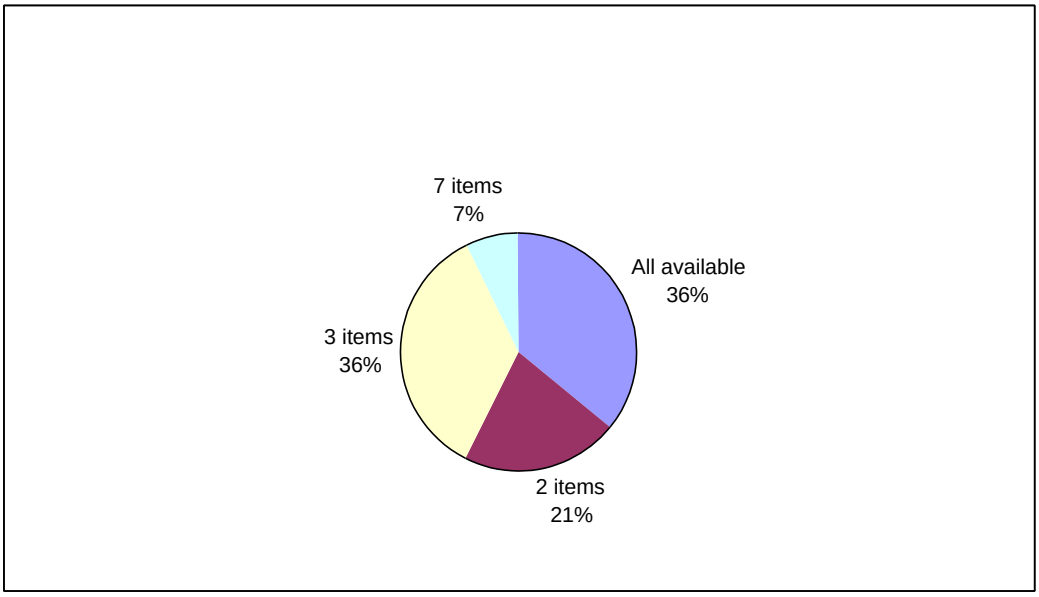
Availability of essential equipment items for clean and safe delivery

It was clear that clean and safe delivery equipment availability, in general, was quite low. As part of the data analysis, RPM checked for seven items within the clean and safe delivery equipment packages that were considered critical. By disaggregating the data in this manner it was possible to see if facilities were equipped with absolutely essential items to conduct safe and clean delivery. The seven items identified were—

- Stethoscope
- Foetalscope
- Sphygmomanometer
- Cord scissors, 10 cm
- Artery forceps, 8”
- Macintosh (plastic) sheet
- Suction machine

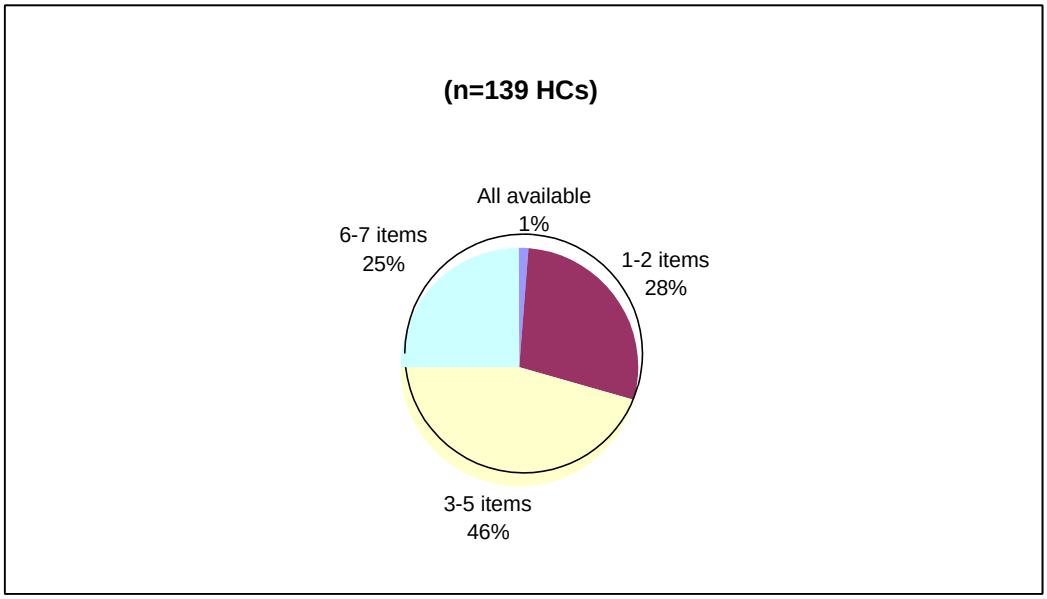
The percent of hospitals and health centers missing the critical items are shown in Figures 33 and 34. Key findings follow each figure.

Figure 33. Percent of hospitals missing critical clean and safe delivery equipment



- Five hospitals out of 14 (36%) had all seven critical equipment items for labor and delivery.

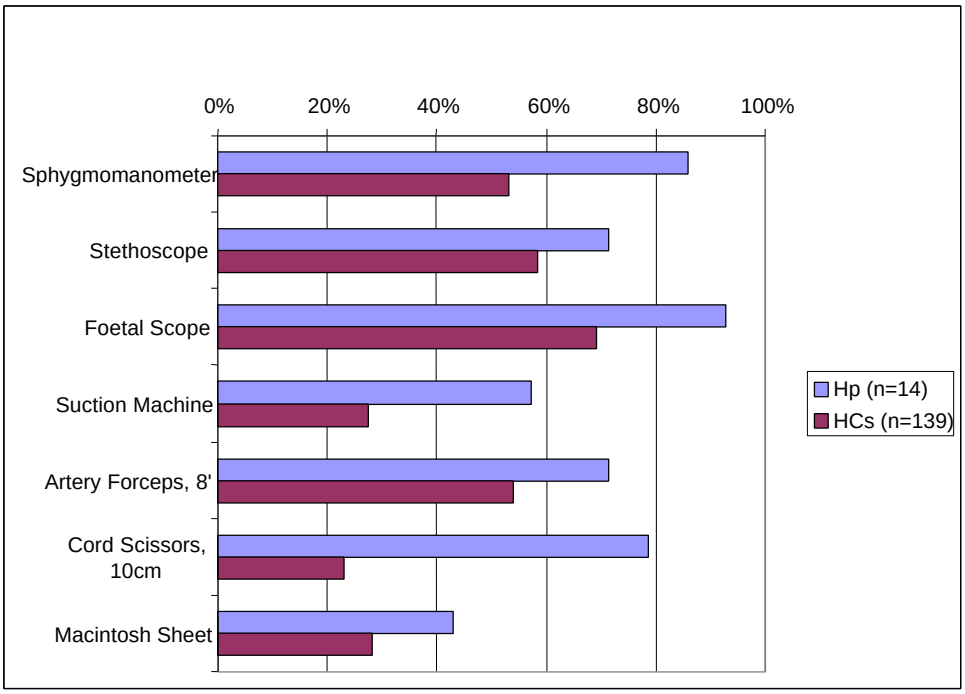
Figure 34. Percent of health centers missing critical labor/delivery equipment



- Only two health centers (1.4%) had all items available.
- One-quarter of health centers did not have either six or seven critical labor and delivery equipment items.

Figure 35 summarizes the percentage of facilities where each critical equipment item was found at the time of the survey. This table illustrates the availability of each individual item that was considered critical for clean and safe delivery.

Figure 35. Facilities with critical labor/delivery equipment available



Availability of equipment for obstetric surgery

While health centers and hospitals both provide clean and safe delivery services, hospitals are better equipped, with both supplies and personnel, for obstetric surgery. For this reason, data collectors only reviewed the OB surgery items at the 14 hospitals surveyed.

When data collectors visited the 11 districts, the Central Board of Health of Zambia requested that, when checking the medical equipment availability, they look specifically at C-section and post-abortion care equipment. The CES team, in consultation with local experts, broke down the OB surgery equipment package into those two categories. The following section describes the equipment availability for Cesarean section and post-abortion care. It is followed by an analysis of the availability of a subset of critical OB surgery equipment.

Equipment for C-section

C-section equipment included 33 items. The percentage of hospitals with C-section equipment available is presented in Figure 36. The data reveal that that only 11 out of 33 items were found at 60 percent or more of the hospitals surveyed.

Figure 36. Percent of 14 hospitals with C-section equipment items available

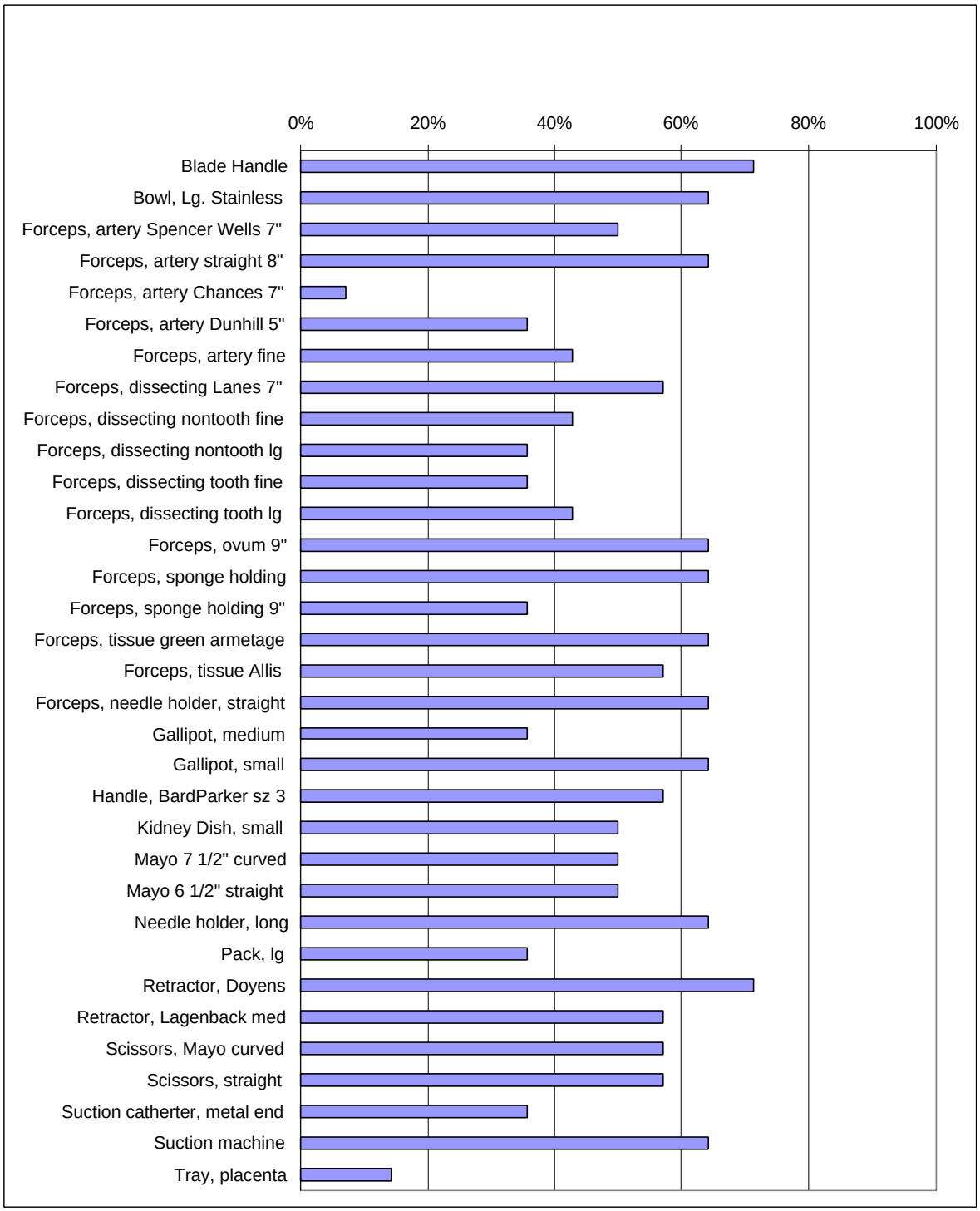
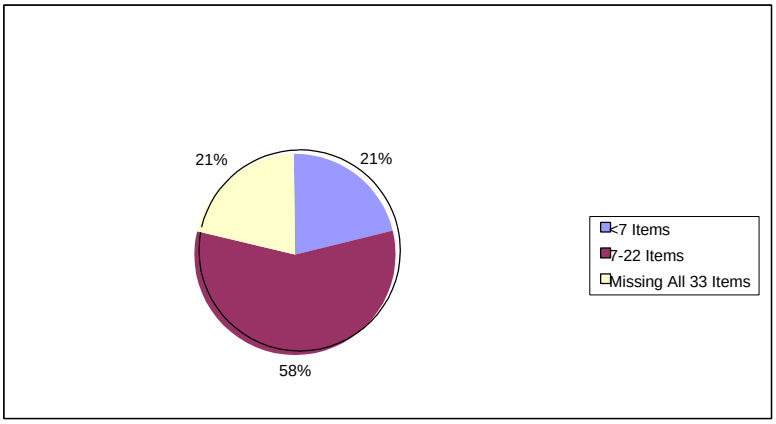


Figure 37 illustrates the number of items that were missing at hospitals.

Figure 37. Number of C-section equipment items missing at 14 hospitals



In particular, no hospital had all 33 C-section equipment items. Three hospitals (21%) did not have any of the medical equipment for C-section. In addition, more than half of the 14 hospitals surveyed were missing between seven and 22 items.

Equipment for post-abortion care

Figure 38. Percent of hospitals with equipment for post-abortion care

Data were also collected on the availability of 12 medical equipment items for post-abortion care (see Figure 38). In general, the availability of these items was very low at the surveyed hospitals.

Figure 39 demonstrates that four hospitals had none of the necessary equipment items at the time of the survey. Between 6 and 11 items were not available at another 5 hospitals (36%).

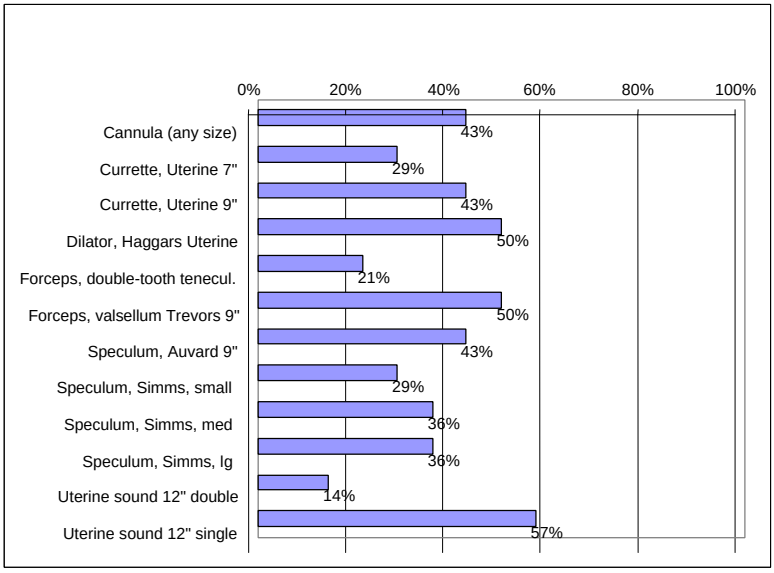
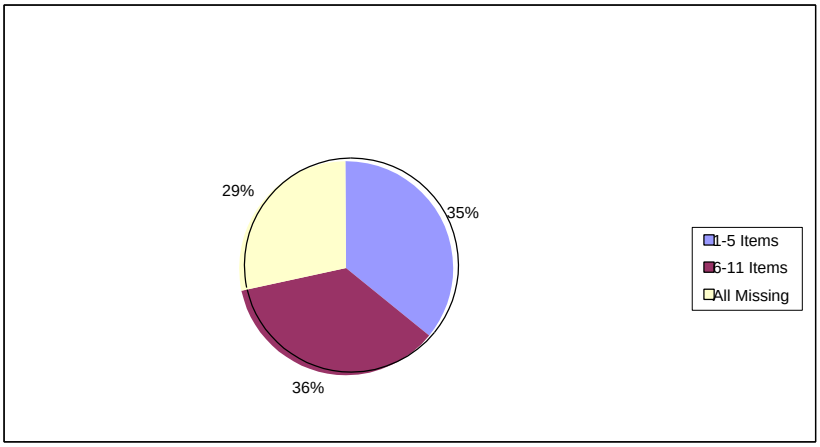


Figure 39. Hospitals missing post-abortion care equipment items



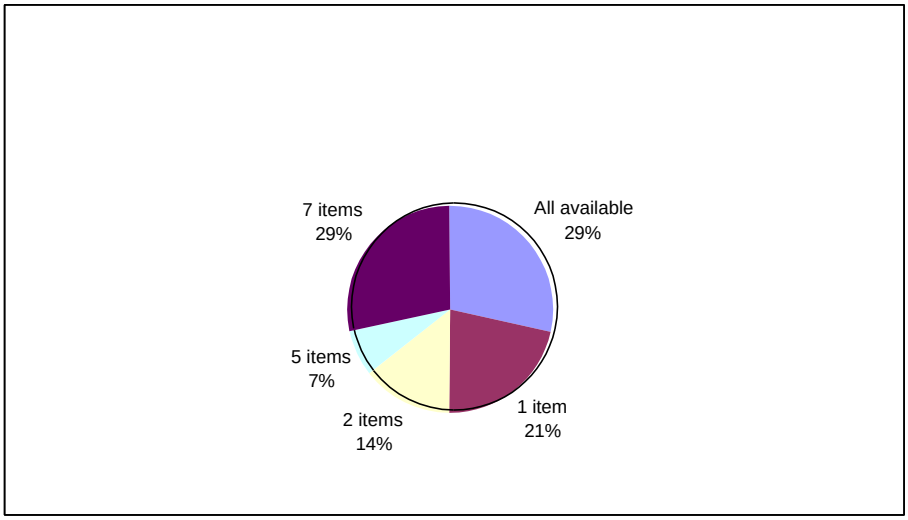
Availability of critical equipment items for OB surgery

As with clean and safe delivery equipment, it was clear that OB surgery equipment availability was low. To supplement the data analysis, RPM check for seven items within the OB surgery equipment package that were considered critical. By disaggregating the data in this manner it was possible to see if facilities were equipped with absolutely essential items to conduct OB surgery. The seven items identified were—

- Blade handle
- Artery forceps (any)
- Sponge forceps (any)
- Tissue forceps (any)
- Abdominal sheet or green towel
- Lagenbeck retractors
- Mayo scissors (any)

Figure 40 presents the breakdown of hospitals by the number of equipment items that were missing at the time of data collection.

Figure 40. Hospitals missing essential OB surgery equipment



In terms of availability of critical items for OB surgery, the hospitals fell into two distinct groups. Four hospitals had all 7 critical items, and another 3 hospitals were missing one item. This means that over half of the hospitals had high availability of 6 or seven of the critical OB surgery items. On the other hand, 4 hospitals did not have any of these equipment items. One hospital was missing 5 items. These 5 hospitals with poor equipment availability are 3 district hospitals and 2 mission hospitals. Three of them are in Luapula District.

CES Survey: Reported Treatment Practices

In addition to reviewing the availability of services, drugs, supplies, and equipment at health facilities, data collectors gathered information on actual treatment practices by health care providers. Face-to-face interviews were conducted with 260 health care providers. The health care providers were asked to describe how they treated their last patient for each of the following conditions:

- First antenatal care visit
- Clean and safe delivery
- Pre-eclampsia
- Puerperal sepsis
- Vaginal discharge with and without pain

Data collectors did not provide any information about what responses (i.e., which drugs or laboratory tests) were expected from respondents and they recorded responses without offering any judgements. To analyze the data, RPM and the data collectors compared the recorded treatment practices to the standard treatment guidelines prepared for the cost estimates (see the methodology section for more explanation of the STGs).

Respondents included the following (see Annex F for a detailed breakdown of respondents by type and location):

- 14 doctors (8 obstetric and gynecology specialists and 6 general practitioners)
- 46 clinical officers (individuals who have received more training than a nurse but less than a doctor)
- 75 midwives (13 registered midwives and 62 enrolled midwives)
- 89 nurses (15 registered nurses and 74 enrolled nurses).

Thirty-six of the respondents had not treated any patient with a target condition during the six months prior to the survey. Their responses were excluded from the analysis, thereby bringing the total number of responses to 224. It is also important to note that some respondents had seen more of certain types of cases than others, meaning that the number of cases was not evenly distributed across respondents.

First antenatal care visit

Eleven doctors, 39 clinical officers, 58 midwives, and 86 nurses stated that they had seen a pregnant women who came for her first antenatal care visit during the previous six months. The recommended treatment protocol for the first antenatal care visit includes the provision of ferrous sulfate (iron) , folic acid, tetanus toxoid, malaria prophylaxis with chloroquine, and, if needed, malaria treatment with quinine. Compliance with the recommended treatment protocol for basic antenatal care is summarized in Figure 41.

Figure 41. Percent of respondents who provided the recommended treatment at the first ANC visit

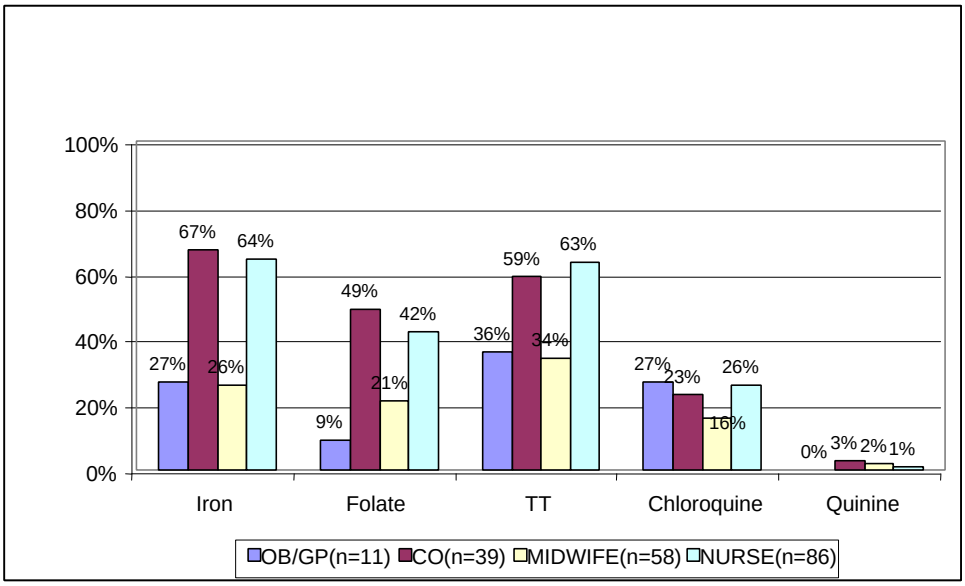


Figure 41 shows that—

- About 60% of clinical officers and nurses prescribed ferrous sulfate and tetanus toxoid. Also, more than 40% of clinical officers and nurses mentioned folic acid. Fewer doctors and midwives mentioned these three items than did clinical officers and nurses.
- The use of chloroquine at the first antenatal visit was mentioned by less than 30% of all health care providers interviewed. The rate was especially low among midwives.
- Very few respondents mentioned quinine as a treatment during the first ANC visit.

The health care practitioners were also asked about the laboratory tests they ordered during the same first antenatal care visits. The laboratory tests recommended at the time of first antenatal care visits are—

- Urinalysis
- Blood grouping
- Hemoglobin
- RPR (rapid precipitation reaction test, for syphilis)
- Malaria smear
- Stool test

Their responses are summarized in Figure 42.

Figure 42. Percent of respondents who ordered recommended laboratory tests at first ANC visit

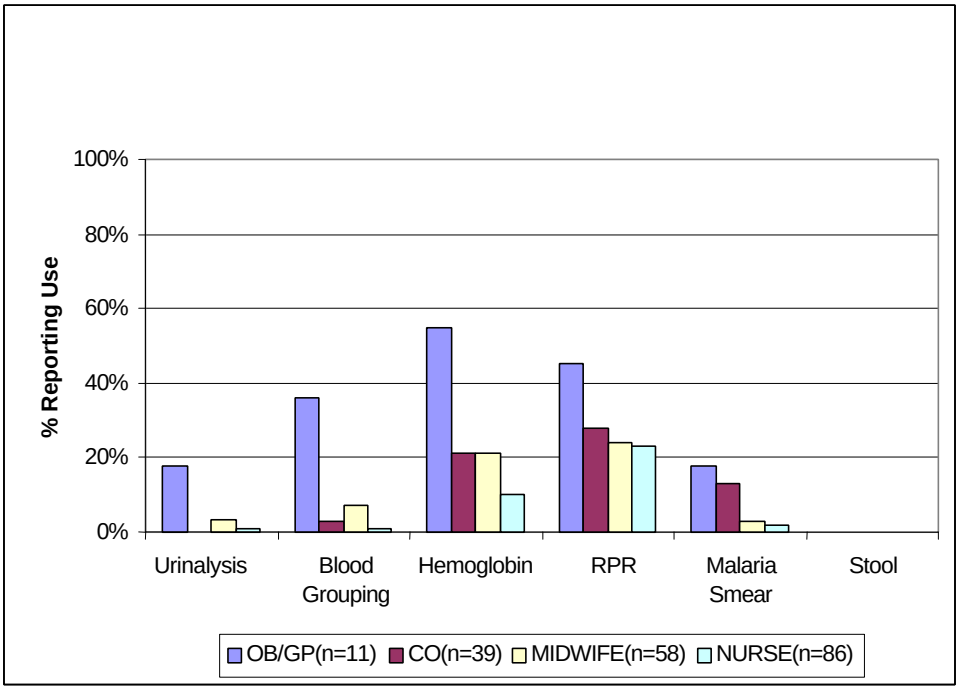


Figure 42, above, summarizes the responses of health care practitioners. It is clear from the graph that—

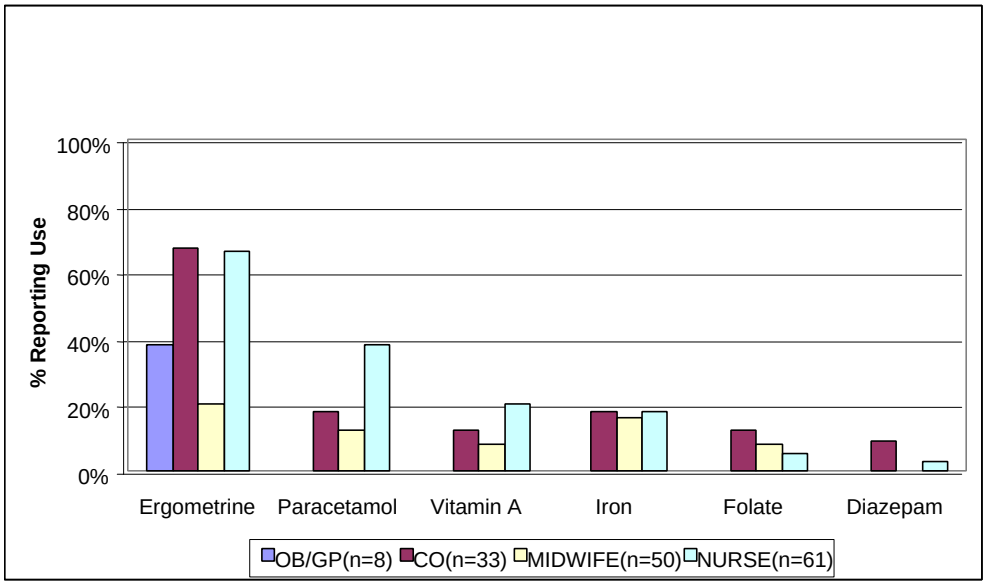
- Among four types of health care providers, doctors more frequently mentioned the laboratory tests included in the treatment protocol. Still, about half or more doctors did not mention these basic laboratory tests.
- Hemoglobin and RPR test were two tests mentioned most frequently by clinical officers, midwives, and nurses.
- Most clinical officers, midwives and nurses did not mention urinalysis, blood grouping, and malaria smear.
- No respondents mentioned stool test.

Clean and safe delivery

Eight doctors, 33 clinical officers, 50 midwives, and 61 nurses gave responses for clean and safe delivery. The protocol for clean and safe delivery includes ergometrine, paracetamol, vitamin A. Tetracycline eye ointment, while included in the STGs and available in many facilities, was generally not used for clean and safe delivery.

Respondents also mentioned treating patients with iron, folate, and diazepam, and those responses are included in Figure 43 below.

Figure 43. Drugs prescribed to treat clean and safe delivery and percent of respondents who provided each treatment



The responses above show that—

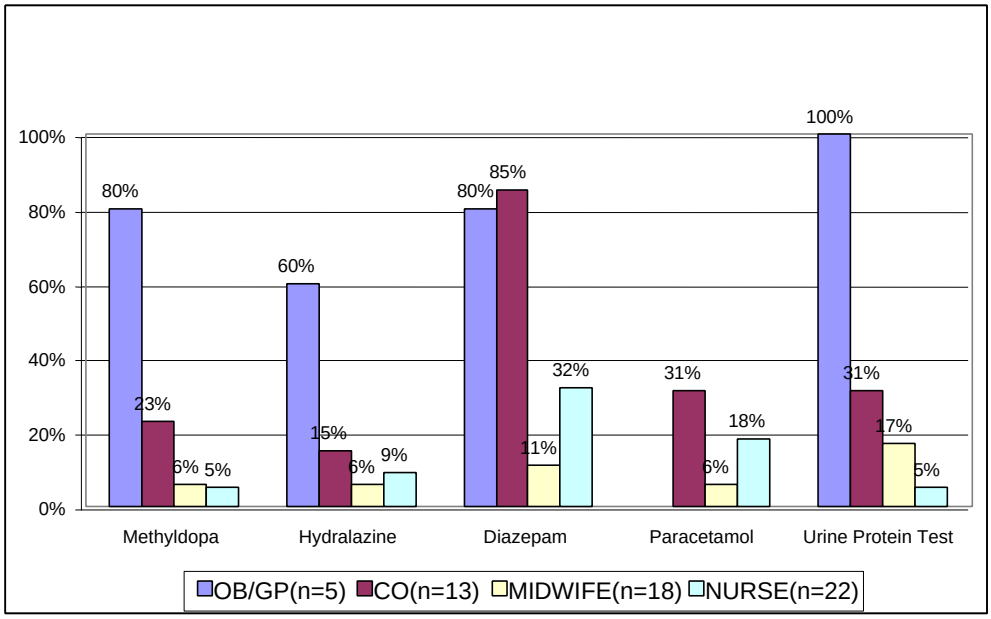
- Ergometrine was the drug most frequently mentioned across the four types of respondents. It was reported most by clinical officers (67%) and nurses (66%). However, rates among doctors (38%) and midwives (20%) were lower than expected.
- Use of paracetamol, a pain killer, was low, especially among doctors, clinical officers, and midwives. The responses indicate that pain control for postnatal women is not adequately addressed at the facilities surveyed.
- Vitamin A was mentioned by fewer than 20% of all types of health care providers interviewed.
- Nine percent of clinical officers and 3% of nurses mentioned the use of diazepam during the last episode of clean and safe delivery.

Pre-eclampsia

The treatment protocol for pre-eclampsia recommends the use of methyldopa, hydralazine, nifedipine, magnesium sulfate, and diazepam for women who develop eclampsia. Sodium chloride and dextrose were also included in the protocol, but these IV fluids were scarce at facilities (see the discussion on IV fluids on page 44). Similarly, nifedipine was not generally available in Zambia at the time of the survey because it was not included in the Zambian national EDL. Therefore it was omitted from this discussion.

The interview question did not clearly distinguish between pre-eclampsia and eclampsia. The combined responses about drugs and laboratory tests (urinalysis) are shown in Figure 44. Five doctors, 13 clinical officers, 18 midwives, and 22 nurses gave responses about pre-eclampsia.

Figure 44. Drugs prescribed to treat pre-eclampsia and percent of respondents who provided each treatment



- More doctors seem to be familiar with appropriate treatment of pre-eclampsia and eclampsia compared with other types of health care providers.
- Only doctors frequently ordered urine protein tests. The rates reported by other practitioners were much lower for this laboratory test.
- Thirty-one percent of clinical officers 6% of midwives, and 18% of nurses mentioned using paracetamol for pre-eclampsia, though it is not clear why they chose to use paracetamol.

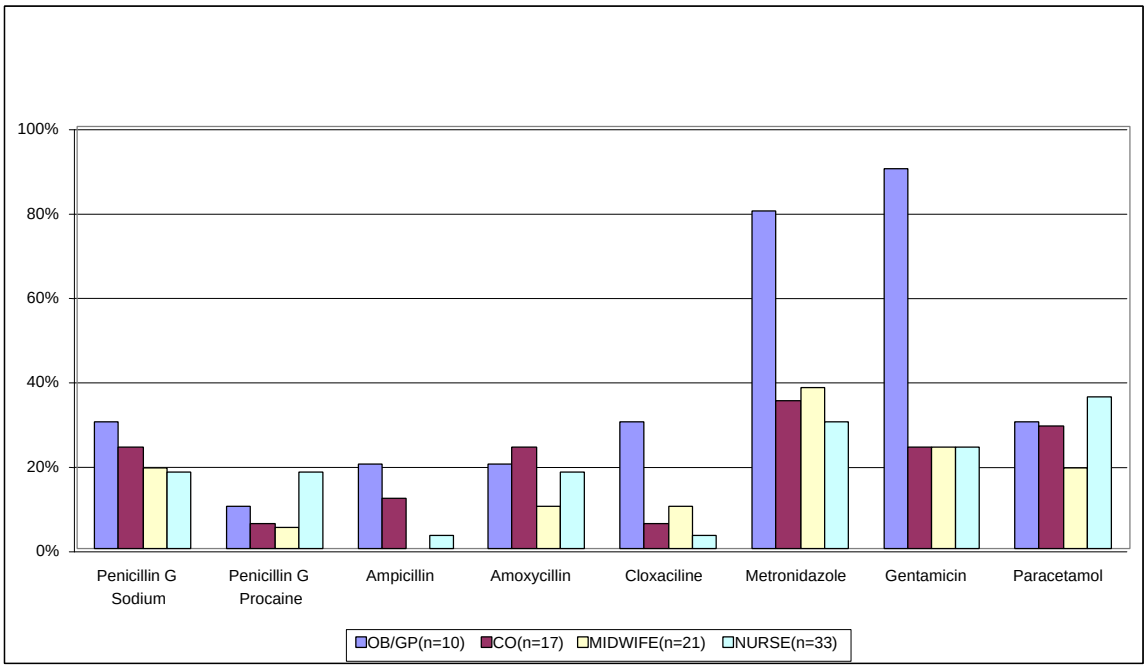
Overall, the responses suggest that the management of blood pressure in pregnant women is not adequately carried out, especially at lower levels of care where doctors and clinical officers are not present.

Puerperal sepsis

The first-line treatment protocol for puerperal sepsis lists two antimicrobials, penicillin G sodium and metronidazole, and paracetamol. The second line treatment includes the same three drugs plus gentamicin, another antimicrobial. Dextrose was also included in the treatment protocol, but as with other IV fluids (see discussion of IV fluids on page 44), dextrose was not available in general, especially at health centers. Ten doctors, 17 clinical officers, 21 midwives, and 33 nurses gave responses for puerperal sepsis.

The interviews with health care practitioners revealed that several additional antimicrobials were used for cases of puerperal sepsis. The drugs prescribed to women with puerperal sepsis are illustrated in Figure 45.

Figure 45. Drugs prescribed to treat puerperal sepsis and percent of respondents who provided each treatment



Two of the drugs included in the protocol (Metronidazole, and Gentamicin) represented were the two most frequently mentioned items, especially by doctors and clinical officers. Paracetamol was mentioned by about 25% of health care providers. Penicillin G procaine, ampicillin, amoxycillin, and cloxacillin were other antibiotics mentioned that were not included in the treatment protocol.

In order to assess the degree of combination use of antimicrobials for the treatment of puerperal sepsis, the team analyzed the number of antimicrobials mentioned by health care providers (Figure 46).

- Except for one doctor who listed 5 antimicrobials, three was the highest number of antimicrobials mentioned by all types of health care providers.

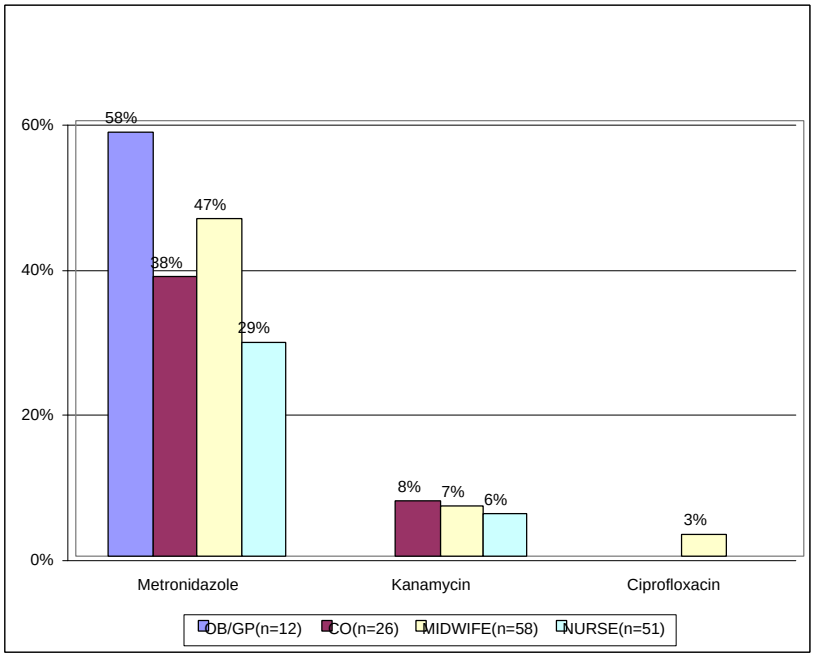
- The number of antimicrobials mentioned for the treatment of puerperal sepsis tended to increases as the level of training of the respondents' increases.

- There are some health care providers who did not mention any antimicrobials: 3 out of 17 of clinical officers (18%), five out of 21 midwives (24%), and 10 out of 33 nurses (30%). The rate seems to increase as the level of training of health care providers' decreases.

Figure 46. Number of antimicrobials mentioned by health care providers for treatment of puerperal sepsis

Vaginal discharge

Figure 47. Percent of respondents who provided the recommended treatment for vaginal discharge



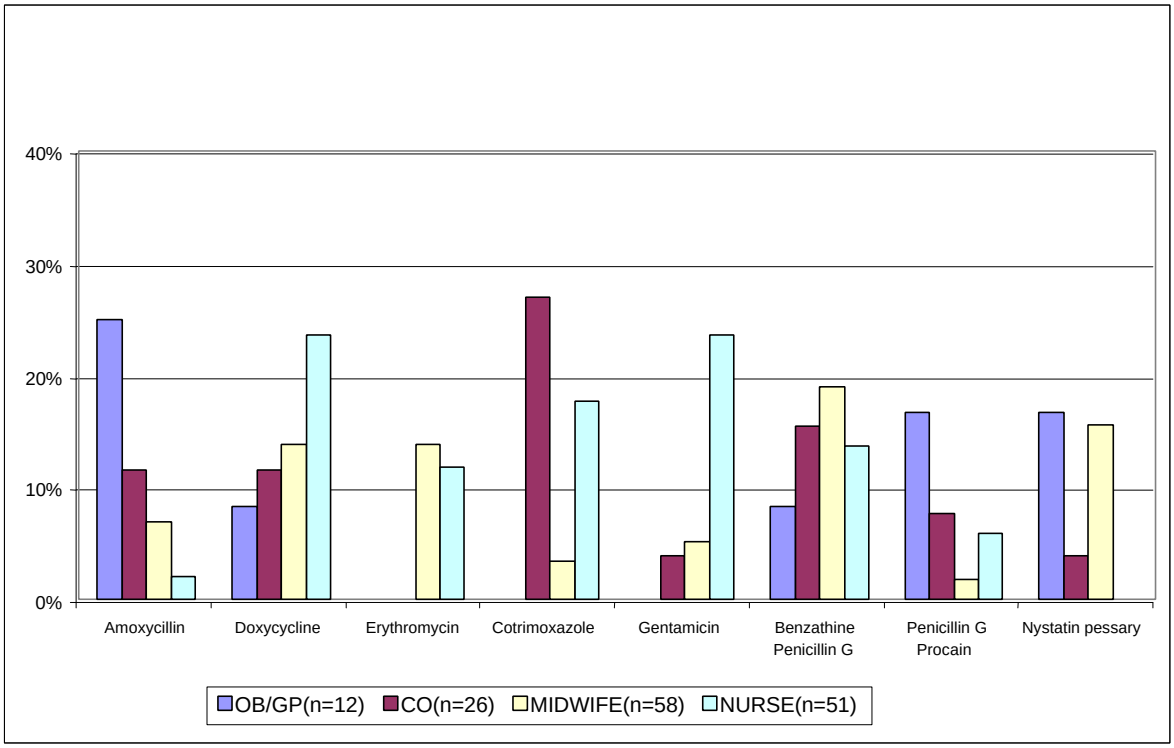
The questions regarding treatment practices for vaginal discharge with pain and vaginal discharge without pain were not clear enough to differentiate the responses for these two conditions. Therefore, the results for both questions are presented together. Twelve doctors, 26 clinical officers, 58 midwives, and 51 nurses gave responses for vaginal discharge.

Figure 47 summarizes responses for three drugs that are included in the treatment protocols for these two conditions, namely metronidazole and kanamycin for vaginal discharge without pain, and ciprofloxacin for vaginal discharge with pain.

- Metronidazole was the only drug included in the treatment protocol that got a high response rate among all respondents.
- The majority of respondents do not mention kanamycin and ciprofloxacin.

Figure 48 presents responses for other drugs that were mentioned by practitioners but not included in the treatment guidelines.

Figure 48. Drugs prescribed for vaginal discharge and percent of respondents who provided each treatment



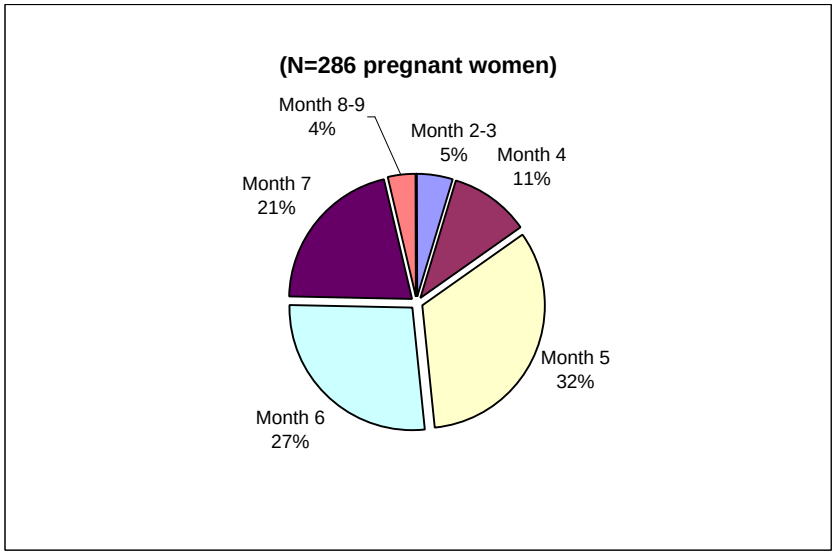
- The number of antimicrobials reported for the treatment of genital discharge ranged between 1 and 3. The average number of antimicrobials mentioned was 1.3 antimicrobials for doctors and clinical officers and 1.4 for midwives and nurse. Therefore, the variety of drugs mentioned by health care providers was not due to the combination of too many drugs. Instead, it represents the diverse selection of antimicrobials reported by health care providers.

In addition to the health facility survey and the health care provider interview, data collectors used a mother interview form to query pregnant and postnatal women at facilities. Two hundred eighty six (286) women visiting the 153 facilities in the 11 districts for pre- or postnatal care were interviewed. The questions focused on the care they received at the first ANC visit and on any out of pocket expenses they assumed. The results are reported below.

Timing of the first visit

The mothers were asked at what point in their pregnancy they received their first antenatal care visit. The results are depicted in Figure 49. The majority of respondents received the first antenatal care during the fifth or sixth month of the pregnancy. The average was 5.7 month. Twenty five percent (25%) of pregnant women came to seek antenatal care at the 7th month or later.

Figure 49. Month in pregnancy at first ANC visit



Services during the first antenatal care visit

The mothers were also asked what type of services they received during their first ANC visit. As mentioned previously, women should receive ferrous sulfate, folic acid, tetanus toxoid, and chloroquine. In addition, they should have several laboratory tests, including urinalysis, blood grouping, hemoglobin, RPR, malaria smear, and stool tests.

Figure 50. Services reported by pregnant women during first antenatal care visit

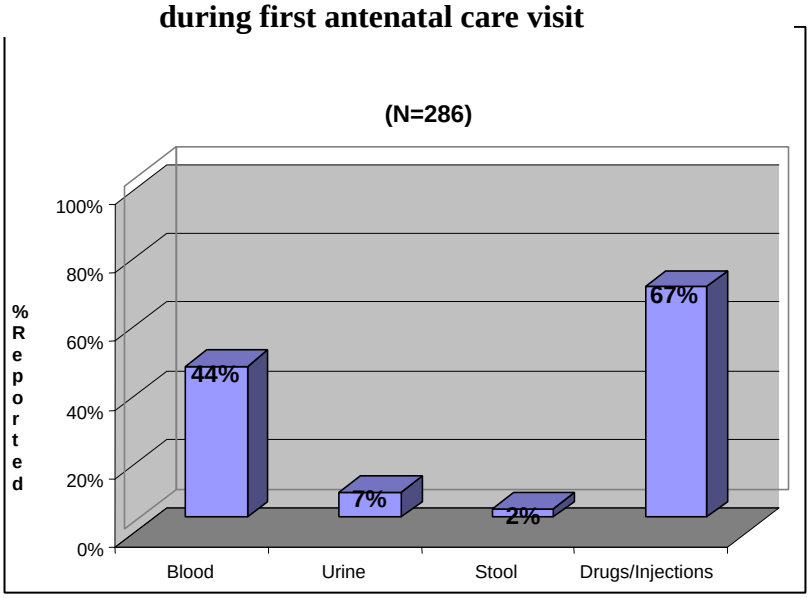


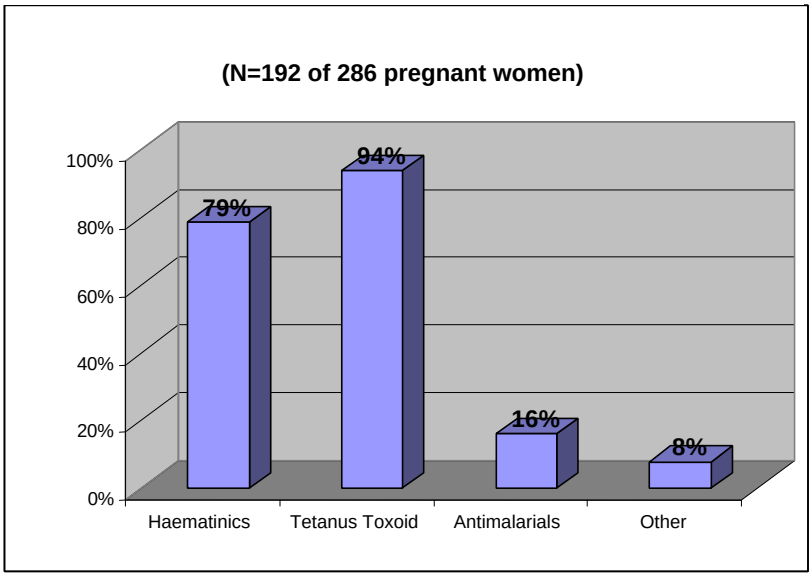
Figure 50 shows that sixty seven percent of respondents said that they received drugs or injections at the first visit. Forty four percent of them said that blood was drawn for test. Very few reported that urine or stool were collected for laboratory tests at the first antenatal care visit.

The low rates of laboratory tests reported by the mothers correspond with the results of the health care provider interview. In that interview, health care providers generally reported ordering few laboratory tests.

Drugs or injections received at first ANC visit

Figure 51. Drugs or injections received at first ANC visit

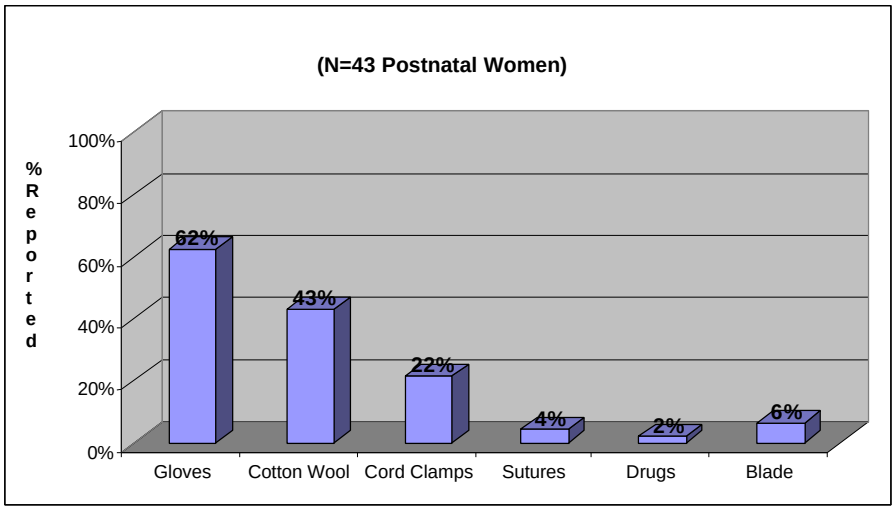
Out of 192 women who said that they received drugs or injections at the first ANC visit, 79 percent reported receiving haematinics and 94 percent said they received tetanus toxoid injections (see Figure 51). Fewer women reported receiving antimalarials. The drug and injection patterns reported by mothers correspond with reported practice patterns by health care providers.



Out-of-pocket expenses on commodities for delivery

The survey also aimed to gather information about any out-of-pocket delivery expenses incurred by mothers. Ninety-three women who just delivered babies and were resting at the facilities were interviewed about what they had purchased for their deliveries and how much they spent. Unlike the antenatal women interview described above, the distribution of respondents by district was not even. Forty-three of these women had incurred personal expenses for their delivery. The short stays at facilities after delivery influenced the number of respondents. In some places it was difficult to locate postnatal women. Annex G provides a breakdown of postnatal women interviewed by location.

Figure 52. Supply items purchased by pregnant women for delivery



As shown in Figure 52, the most common commodity item purchased by women for delivery were gloves (63%), cotton wool (43%), and cord clamps (22%).

The mean out of pocket expenses to bring commodities for delivery was 18,388 Kwacha ($7.07). The median value was 7,000 Kwacha ($2.69). This is because 7 out of 11 women in Kitwe district spent between 10,000 and 80,000 Kwacha for cotton wool and blankets for delivery. If these extreme cases were excluded from the calculation, the mean is 9,250 Kwacha ($3.56) and the median values 6,000 Kwacha ($2.31).

The women were asked how much they paid for each item. Their responses are shown in Figure 53.

Figure 53. Average cost of delivery items purchased by women (in Kwacha)

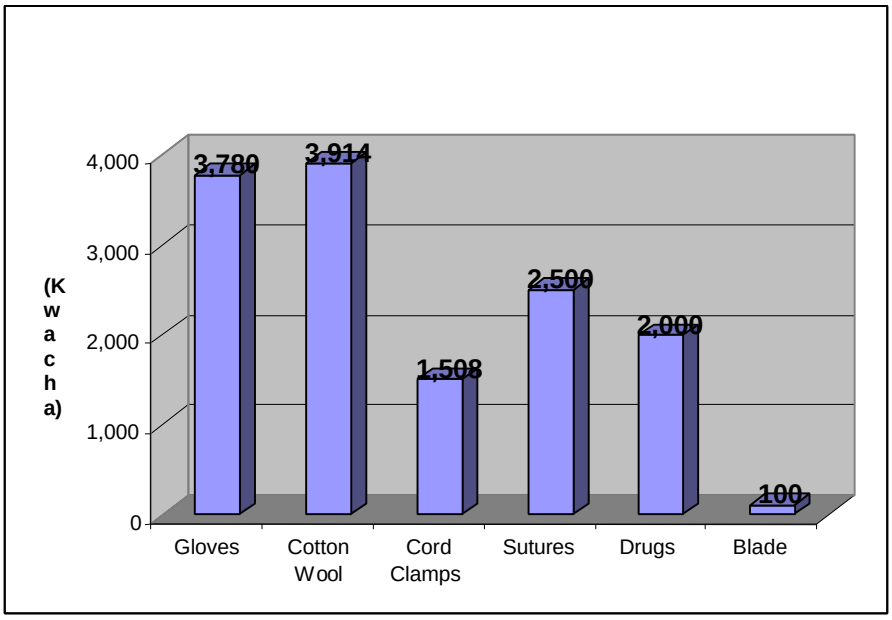


Table 14 shows the average number of commodity items that were purchased per women.

Table 14. Average number of items purchased per woman

Item purchased	Mean # purchased
Gloves	2.7
Cotton Wool	1.7
Cord Clamps	1.0
Drugs	1.0
Blade	1.0

Estimated equipment needs for the 11 sample districts

As noted earlier, the CES team in Zambia developed three types of medical equipment packages: basic antenatal care, clean and safe delivery, and obstetric surgery. In addition, data collectors used the CES Survey to check the availability of these equipment items at 153 facilities in the 11 districts. It was clear from the survey that the most facilities lacked some, and in some cases all, equipment for the various packages.

To estimate the number of items needed to fill the gaps in equipment availability in the districts, RPM combined number of facilities in the districts with the observed needs at 153 facilities. As mentioned in the methodology section, data collectors were not able to visit all facilities in these districts. Therefore, the percentage of all facilities visited (87.5% for hospitals and 60.4% for health centers) was used to estimate total need for all facilities in the 11 districts. For health centers, however, the survey did not cover many rural sites. In order to take into account potentially lower availability of equipment at rural health centers compared with urban health centers, 55% (instead of 60.4%) was used to make a conservative estimate.

RPM generated tables of total additional equipment needs in the 11 districts for each equipment package (see Annex H). Note that the summary of medical equipment needs for obstetric surgery supplies lists needs for hospitals only. Availability information for some items that were not included in the study is unknown.

These data were presented to USAID, which is managing the Zambia Integrated Health project in the 11 districts.

Estimated national commodity needs

RPM extrapolated the commodity needs data generated from the CES Survey to estimate total national commodity needs. The total commodity needs were then combined with available international prices to estimate the costs of filling gaps in drug, supply, and equipment availability nationwide.

Annex I contains the list of needed commodities, broken down by type of commodity, and the estimated total cost for the commodity. RPM presented the lists to two donors to assist them in quantifying possible drug, supply, and equipment donations for the Zambian Integrated Reproductive Health plan.

Conclusions and Recommendations

Individual findings on costs, commodity availability, treatment practices, and services form the bulk of the CES assessment in Zambia. In addition, the data allowed RPM to develop several general conclusions and recommendations that may be of interest to the Zambian MOH and CBOH, Zambian health professionals, and donors. These are presented below and are divided by drug management functions, specifically selection, procurement, use, and management support. Distribution, another important area of drug management, was outside of the scope of this study.

Selection

One of the key results of the CES application in Zambia was the development of standard treatment guidelines for the 14 reproductive health conditions. At the time of the survey, STGs were not in regular use in health facilities. The facilities had outdated formularies and essential drug lists and the data collectors observed that the drugs they prescribed were purchased in the private sector at high costs and some drugs were not in the Essential Drug List.

The STG development process helped build capacity for conceptualizing and defining reproductive health STGs among the CES team. RPM submitted the CES STGs to the CBOH. Concurrently, the CBOH is in the process of defining the national-level STGs, with technical support from RPM. The CES STGs will be helpful in setting the national treatment protocols for the 14 RH conditions and services.

The Reproductive Health Unit and the pharmacists at the MOH/CBOH need to reevaluate the STGs from this study in developing national Standard Treatment Guidelines, formalizing them with the National Formulary Committee. The drugs selected need to be harmonized with the supply managers, the STG, EDL, and formulary committees in a participatory process with the district health workers. These documents should be disseminated to the districts and the health workers should be trained how to use them.

It will be helpful for the MOH and CBOH to review the STGs to choose the drugs and supplies that are most cost-effective, since the cost estimates revealed that including even a few drugs with high unit costs can increase the commodity cost of a selected treatment regimen.

Procurement

The current supply system is facing difficulty maintaining adequate stock levels of drugs and medical supplies to cover the national demand. The facilities that are affected most are the district hospitals. Unlike the rural health centers that receive donor-funded essential drug kits on a monthly basis, the district hospitals depend on the national supply system.

Large-scale purchases of equipment must include training and maintenance programs and/or subcontract maintenance services with a local company. In purchasing equipment provisions must be made for spare parts at the time of purchase. The long lead-time for bulk procurement is another major problems affecting the supply of drugs in Zambia. At the time of the study, Zambia had not conducted an international tender for the last year and a half.

Correcting the supply problems may be beyond the current resources of the government and will require donor support. In seeking a loan or donor resources to support the purchase of commodities, RPM recommends that the MOH/CBOH prioritize the Integrated Reproductive Health plan to make life saving interventions and purchase the drugs, medical supplies and equipment accordingly. Reviewing the quantities to be purchased for each intervention and implementing a VEN and ABC analysis can assist with this process. Several Zambian medical professionals have been trained by RPM to conduct such an analysis.

To facilitate comprehensive budget planning, RPM also recommends that the MOH/CBOH conduct a national quantification exercise for all drugs and medical supplies to establish the real needs and costs to cover the national demand.

Use

The survey interviews and review of patient records revealed that there is a gap in treatment practices and in the knowledge of the health workers. The pharmacy and therapeutic boards in the facilities that were visited did not meet on a regular basis and did not conduct inservice training of personnel. This has contributed to the overuse of certain commodities, such as antibiotic injections, and underuse of others, such as ferrous sulfate. Many health workers told the data collectors that they did not have the proper training to recognize a life threatening illness or to decide when to refer care to another facility.

Client perceptions

A goal of the new reproductive health policy is to make services available within the communities, meaning that patients should be able to go directly to their health centers for delivery and other basic health care needs. However, commodity availability and client perceptions may hinder this plan. While hospitals and health centers both provide normal delivery services, hospitals are more likely to be equipped, both in terms of human and supply resources, to handle obstetric surgery such as Cesarean sections. Data collectors also noted that clients perceive health centers to be less equipped for delivery, and especially for complicated delivery. For this reason, patients often go directly or are referred to hospitals in cases of complicated labor. When implementing the integrated RH plan, it will be necessary to take client behavior into consideration when assigning service availability at the different levels of care.

Management support

Given the available resources, both human and physical, the action plan and policies for Integrated Reproductive Health are too ambitious. The study showed that only a small number of facilities have reliable communication systems, such as radio systems and a functioning

emergency transport system. Many rural health centers did not have access to such a service and in some districts the system needed to be revamped with new vehicles. The ability to access care through better transportation will increase the margin of safety for a given complication, as in the case of a hemorrhage, which must be attended within 2 hours. Basic infrastructure, such as sterilization facilities, incinerators, refuse disposal, and infections control procedures and equipment, were not available in many of the visited facilities.

RPM recommends that the MOH/CBOH revise the integrated RH plan to adopt an incremental approach. To begin, an increase of reliable communication system and emergency transport system can save lives.

Supply availability was consistently lower at health centers than at hospitals, with the exception of a few family planning commodities. For example, Pap smear supplies were not available at most of the surveyed facilities. It is important to note that Pap smears are not a usual practice in Zambia. This in part explains why almost none of the facilities surveyed had the supply capacity to conduct Pap smears. The CBOH has reported that it hopes to recommend that Pap smears be available at all health facilities. The availability data indicates that, if this idea is put into action, health facilities will need supplies and possibly training to implement it. Before implementing this policy, the CBOH should consider the costs of supplies, equipment, and training. Perhaps specialized hospitals, such as general or provincial hospitals, should first be equipped and trained for this service, instead of attempting to provide the service at all facilities.

MIS

Information systems and guidelines on how to channel critical information from the health centers to the districts and beyond are required to strengthen the Health Management Information System at the CBOH and to monitor reproductive health epidemiology.

Finance

At the moment, donors provide almost all family planning products in Zambia. Family planning commodities make up the greatest proportion of national commodity costs, calculated in this study at almost US$11 million. The 1998-99 total Zambian budget for drugs was approximately US$8 million, clearly indicating that there still exists a budgetary gap for meeting needs. Donors may want to consider reviewing the cost estimates to identify opportunities for filling some gaps in health commodity provision for reproductive health. More studies are needed to determine exact needs for donor support of other conditions such as tuberculosis, malaria, and child health.

The district budget allocation should include a separate contingency sum for emergency purchases of supplies for IRH interventions. Revolving funds and user fees for laboratory services should be designed and implemented as soon as possible to allow districts a decentralized drug procurement system when drugs and supplies are in short supply from the national medical stores. In addition, user fees should be reinvested to procure drugs and improve integrated RH services.

Training

RPM recommends augmenting personnel training on standard treatment guidelines, drug use review, patient education, and rational use of drugs. Such training should be included in pre-service and in-service curricula and in specialized seminars or workshops (such as prescribing and dispensing) to close the existing knowledge gap among health personnel.

Furthermore, staff skills should be upgraded as services improve. A district-focused training for district and health center personnel is recommended and standard operating procedures for RH interventions developed as part of the Integrated Reproductive Health policy formulation. Service conditions should improve to attract and retain skilled personnel. For example, the government may consider introducing incentive schemes to reward special efforts from personnel.

Pharmaceutical sector organization

Clear objectives and performance indicators (FAMS, HMIS, and DILSAT) targets should be developed for supervisory visits. Supervision and on site training in integrated reproductive health and RH drug management should be an integral of district activities.

Collaboration between clinicians and other staff and users should be improved. All concerned staff should be represented in management meetings and the Pharmacy and Therapeutic committees and communicate regularly on strategies to improve service. Large health centers (especially in urban areas) that operate as small hospitals should be staffed or at least visited at least once a week by an obstetrician specialist.

Annexes

Annex A: Survey Facilities

Type of Facilities

CH: Central Hospital
GH: General Hospital
DH: District Hospital
RHC: Rural Health Center
UHC: Urban Health Center
OH: Other

Facility Administration

G: Government
M: Mission
I: Industry

PROVINCE	DISTRICT	TYPE	ADMINI-STRATION	NAME
Eastern	**Lundazi**	DH	G	Lundazi District Hp
		RHC	G	Lusuntha
		RHC	G	Mwase Lundazi
		RHC	G	Chitungull
		RHC	G	Kazembe
		RHC	G	Kapichila
		RHC	G	Zumwanda
		RHC	G	Lumezi
		RHC	M	Kanyanga
		RHC	G	Old Mwasemphangwe
		RHC	G	Masemphange (Schemes)
		RHC	G	Munyukwa
		RHC	G	Malandula
		RHC	G	Chasefu
		RHC	G	Chikomeni
		RHC	G	Phikamalaza
		RHC	G	Lunzi
		RHC	G	Mtwalo
Eastern	**Chipata**	GH	G	Chipata Gen. Hp
		OH	M	Mwami Mission Hp
		UHC	G	Kapata
		RHC	G	Msekera
		RHC	G	Champhande
		RHC	G	Chikando
		RHC	G	Chinunda
		RHC	G	Chipangali
		RHC	G	Chiparamba
		RHC	G	Jerusalem
		RHC	G	Kapara
		RHC	G	Kasenegwa
		RHC	G	Kwenje
		RHC	G	Madzimoyo
		RHC	G	Madzimawi
		RHC	G	Mkanda
		RHC	M	Muzeyi
		RHC	G	Mnoro
		RHC	G	Mshawa
		RHC	G	Tamanda
		RHC	G	Kamlaza
		RHC	G	Vizenge

PROVINCE	DISTRICT	TYPE	ADMINI-STRATION	NAME
Central	**Chibombo**	DH	G	Liteta
		RHC	G	Mwachisompola Demo
		RHC	G	Mwachisompola
		RHC	G	Chikabo
		RHC	G	Chisamba
		RHC	G	Chipembi
		RHC	G	ZNS-Chisamba
		RHC	G	Golden Valley
		RHC	G	Malambanyama
		RHC	G	Chibombo
		RHC	G	Keembe
		RHC	G	Kaparu
Central	**Kabwe**	GH	G	Kabwe Gen. Hp.
		IH	I	Kabwe Mine
		UHC	G	Mahatma Ghandi
		RHC	I	Railway Surgery
		UHC	G	Mukobeko
		UHC	G	Ngungu
		UHC	G	Bwacha
		UHC	G	Nakoli
		UHC	G	Natuseko
Northern	**Kasama**	GH	G	Kasama Hp.
		RHC	G	Location
		RHC	G	Tazara
		RHC	G	Musa
		RHC	G	Muilima
		RHC	G	Lukashya
		RHC	G	Lukupa
		RHC	G	Mwamba
		RHC	G	Lubushi
		RHC	G	Kateshi
		RHC	G	Munkonge
		RHC	G	Chlombo
Copper Belt	**Ndola**	CH	G	Ndola Central Ho.
		UHC	G	Bwafwano
		UHC	G	Ndeke
		UHC	G	Kawama
		UHC	G	Nkwazi
		UHC	G	Kansenshi Prison
		UHC	G	Kanganga
		UHC	G	New Mushili
		UHC	G	New Kaloko
		UHC	G	Lubuto
		UHC	G	Kabushi
		UHC	G	Chipulukusu
		UHC	G	Kaniki
		UHC	G	Dola Hill
		UHC	G	New Masala
		UHC	G	Sathya Sai
		UHC	G	Twapia

PROVINCE	DISTRICT	TYPE	ADMINI-STRATION	NAME
Copper Belt	**Kitwe**	CH	G	Kitwe Central Hp.
		UHC	G	Luanswa
		UHC	G	Ndeke
		UHC	G	Buchi Main
		UHC	G	Bulangililo
		UHC	G	Chimwemwe
		UHC	G	Ipusukilo
		UHC	G	Kawama
		UHC	G	Itimpi
		UHC	G	Kwacha
		UHC	G	Kamfisa
		UHC	G	Chavuma
Luapula	**Mwense**	DH	G	Mwense Dist. Hp.
		OH	M	Mabilima Miss. Hp.
		RHC	G	Kawama
		RHC	G	Lukwesa
		RHC	G	Musangu
		RHC	G	Lubunda
		RHC	G	Mukowshi
		RHC	G	Mwenda
		RHC	M	Chipili
		RHC	G	Mutipula
		RHC	G	Lumino
		RHC	G	Mubende
		RHC	I	Musonda (ZESCO)
		RHC	G	Kashiba
Luapula	**Samfya**	DH	G	Samfya Dist. Hp.
		OH	M	Lubwe Miss. Hp.
		RHC	G	Shikamushile
		RHC	G	Miponda
		RHC	G	Mbabala
		RHC	G	Kalasakmukoso
		RHC	G	Kasanka
		RHC	G	Kabongo
		RHC	G	Mabo Kunda
		RHC	G	Katanshya
		RHC	G	Kapata
		RHC	G	Kapata East 1
		RHC	G	Njipi
Southern	**Kalomo**	RHC	M	Zimba
		RHC	G	Kalomo
		RHC	G	Chilala
		RHC	G	Chifusa
		RHC	G	Siachitoma
		RHC	G	Dimbwe
		RHC	G	Simwatachela
		RHC	G	Choongo
		RHC	G	Mukwela
		RHC	G	Namwianga
		RHC	G	Siamafumba

PROVINCE	DISTRICT	TYPE	ADMINI-STRATION	NAME
Southern	**Livingstone**	GH	G	Livingstone Gen. Hp.
		UHC	G	Dombwa
		UHC	G	Maramba
		UHC	G	Victoria Falls
		UHC	G	Livingstone Teacher Teaching College
		UHC	G	Livingstone Trades Training
		UHC	G	Airport
		UHC	G	Police camp
		UHC	G	Libugu
		UHC	G	Linda
		UHC	G	Zambia Railways/MCH
		UHC	I	Railways Zambia
		UHC	G	Bomba Clinic

Basic Antenatal Care

Basic Antenatal Care — *Category:* **Antenatal Care**

Expected Cases: 87,280

Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
Antenatal care	1	FERROUS SALT	PO	200	mg	Tablet	3	196	100%	FESALT:200MG/TAB:TAB
	1	FOLIC ACID	PO	5	mg	Tablet	1	196	100%	FOLICAC:5MG/TAB:TAB
	1	TETANUS TEXOID VACCINE	IM	1	dose	amp	1	2	100%	TETANUST:1DOS/AMP:INJ
Malarial prophyla	1	CHLOROQUINE PHOSPHATE	PO	300	mg	Tablet	1	2	100%	CHLRQUIN:150MG/TAB:TAB
Worm infestation	1	MEBENDAZOLE	PO	100	mg	Tablet	2	3	100%	MEDANDAZOLE:100MG/TAB:TAB

Note:

Basic Antenatal Care

Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins	Total Quantity	% Cases Treated	Supply Pack Size
Basic ANC Care	1	antenatal record		1	1	1	100%	1 each
Urinanalysis	1	urine dipsticks		1	1	1	100%	bottle of 100
HB	1	glass tube, capillary		1	1	1	100%	1 each
	1	lancet		1	1	1	100%	1 each
Blood grp & RH	1	glass tube, blood, red top		1	1	1	100%	1 each
Tetanus Vaccine	1	syringe and needle, 2cc		1	1	1	100%	1 each
Syphyllis test	3	syringe and needle, 5cc		1	1	1	100%	1 each
	3	RPR kit		1	1	1	100%	1 each

Antenatal Treatment

Antenatal Treatment										
			Expected Cases:	29,501		*Category:*	Antenatal Care			
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
Malarial treatment	1	CHLOROQUINE PHOSPHAT	PO	600	mg	Tablet	1	2	100%	CHLRQUIN:150MG/TAB:TAB
	1	CHLOROQUINE PHOSPHAT	PO	600	mg	Tablet	1	1	100%	CHLRQUIN:150MG/TAB:TAB
	1	PARACETAMOL	PO	1000	mg	Tablet	3	3	100%	PARACET:500MG/TAB:TAB
Resistant Malaria	2	QUININE HYDROCHLORIDE	IV	300	mg	Vial	3	5	30%	QUINHY:300MG/VIAL:INJ
	2	SULPHADOXINE/PYRMETI	PO	500	mg	Tablet	1	1	10%	SULPHAMET:500MG/TAB:TAB

	Note:	

Antenatal Treatment								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
Resistant Malaria	2	syringe and needle, 5cc	QUININE INJ	1	1	1	10%	1 each
	2	Canullae	QUININE INJ	1	1	1	10%	1 each
	2	IV set	QUININE INJ	1	1	1	10%	1 each
	2	Cotton wool	QUININE INJ	1	1	1	100%	ball

Pre-eclampsia

Pre-Eclampsia				Category:		Antenatal Care				
		Expected Cases:	433							
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
Pre-eclampsia	2	METHYLDOPA	PO	250	mg	tablet	1	28	100%	METHYLDO:250MG/TAB:TAB
Eclampsia	2	HYDRALAZINE	IV	10	mg	amp	2	2	4%	HYDRALAZ:20MG/ML:1/AMP:INJ
	2	SODIUM CHLORIDE	IV	1000	ml	infusion	2	2	4%	SODCHL:1000/ML:VIAL:IV
	2	NIFEDIPINE		10	mg	tablet	3	5	2%	NIFEDIPINE:10MG/TAB
	2	MAGNESIUM SULPHATE	IV	500	g	amp	12	2	4%	MAGNESIUM SULPH:5G/10ML:AMP
	2	DIAZEPAM	IV	40	mg	amp	1	2	10%	DIAZEPAM:10MG/ML:2ML/AMP:INJ
	2	DEXTROSE	IV	500	ml	bottle	1	2	10%	DEXTROSE:5%/ML:1000/bottle

Note:	

Pre-Eclampsia								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
Pre-eclampsia	2	urine dipsticks		1	1	1	100%	bottle of 100
Eclampsia	2	syringe and needle, 5cc	Hydralazine	1	2	2	4%	1 each
	2	IV set	Sodium chloride	1	1	1	4%	1 each
	2	canullae	Sodium chloride	1	1	1	4%	1 each
	2	IV set	Magnesium sulphate	1	1	1	4%	1 each
	2	IV set	Diazepam	1	1	1	10%	1 each
	2	canullae	Diazepam	1	1	1	10%	1 each

Clean and safe delivery

Clean and safe delivery — *Category:* **Deliveries**

Expected Cases: 43,268

Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
Clean and safe de	1	ERGOMETRINE MALEATE	IM	0.5	mg	Amp	1	1	100%	ERGOMAL:0.5MG/ML:1/AMP:INJ
	1	PARACETAMOL	PO	1000	mg	Tablet	3	2	100%	PARACET:500MG/TAB:TAB
	1	VITAMIN A	PO	200000	IU	Cap	1	1	100%	VITAMIN A:200000IU/CAP:PO
Neonate	1	TETRACYCLINE HCL	OPHT	3.5	g	Tube	1	1	100%	TETRACYC:1%/GM:3.5/TUBE:TOP

Note:

Clean and safe delivery

Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
Clean & safe deliv	1	gloves, sterile		1	2	2	100%	1 pair
	1	cotton wool		1	1	1	100%	ball
	1	syringe and needle, 5cc	ergometrine	1	2	2	100%	1 each
	1	hypochloride		1	1	1	100%	5 liter
	1	Machintosh sheeting		1	1	1	100%	1 each
Neonate	1	cord clamp		1	1	1	100%	1 each
	1	endotracheal tube sz 7.5		1	1	1	1%	1 each
	1	suction catheter sz 10		1	1	1	100%	1 each

Laceration and episiotomy

Lacerations and Episiotomy				Category:		Deliveries				
		Expected Cases:	8,091							
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
	1	LIDOCAINE HCL	IM	5	ml	vial	1	1	100%	LIDOC:1%/ML:50/VIAL:INJ
	1	PARACETAMOL	PO	1000	mg	tablet	3	3	100%	PARACET:500MG/TAB:TAB

	Note:	

Lacerations and Episiotomy								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
	1	syringe and needle, 5cc	Lidocaine	1	1	1	100%	1 each
	1	sutures, chromic catgut ss		1	1	1	100%	1 each
	1	sutures, silk 2/0		1	1	1	100%	1 each
	1	cotton wool		1	1	1	100%	ball

Cesarean section

Caesarian Section					Category:	Deliveries				
		Expected Cases:	3,505							
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
	2	GENTAMICIN SULFATE	IM	20	mg	inj	3	3	100%	GENTAMIC:40MG/ML:1/AMP:INJ
	2	THIOPENTAL	IV	0.5	mg	amp	1	1	100%	THIOPENT:500MG/VIAL:INJ
	2	STERILE WATER	IV	5	ml	vial	1	1	100%	STRLWAT:10 ML
	2	ATROPINE SULFATE	IV	0.6	mg	amp	1	3	100%	ATROPINE:1MG/ML:1/AMP:INJ
	2	SUXAMETHONIUM CL	IV	100	mg	amp	1	1	100%	SUXAMETH:50MG/ML:1/AMP:INJ
	2	PARACETAMOL	PO	500	mg	tablet	3	3	100%	PARACET:500MG/TAB:TAB
	2	SODIUM CHLORIDE	IV	2000	ml	bottle	3	1	100%	SODCHL:1000/ML:VIAL:IV
	2	PANCURONIUM BROMIDE	IV	4	mg	amp	1	1	100%	PANCURON:2MG/ML:2/AMP:INJ
	2	NEOSTIGMINE	IV	2.5	mg	amp	1	1	100%	NEOSTIGM:2.5MG/ML:1/AMP:INJ
	2	PETHIDINE	IV	100	mg	amp	2	3	100%	PETHIDIN:100MG/ML:1/VIAL:INJ
	2	DEXTROSE	IV	1000	ml	bottle	1	1	100%	DEXTROSE:5%/ML:1000/bottle
	2	PROMETHAZINE	IM	10	mg	amp	1	3	100%	PROMETH:25MG/ML:2/AMP:INJ
	2	ERGOMETRINE MALEATE	IM	0.5	mg	amp	1	1	80%	ERGOMAL:0.5MG/ML:1/AMP:INJ
	2	UNIT OF BLOOD		1	l	bag	1	1	4%	BLOOD
	2	OXYTOCIN	IV	5	IU	amp	2	1	10%	OXYTOCIN:10IU/ML:1/AMP:INJ

Caesarian Section								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins	Total Quantity	% Cases Treated	Supply Pack Size
In addition to sup	2	suction catheter sz 10		1	1	1	100%	1 each
for normal birth	2	scalpel blade sz 23		2	1	2	100%	1 each
	2	sutures, chromic catgut sz		7	1	7	100%	1 each
	2	sutures, silk 2/0		1	1	1	100%	1 each
	2	endotracheal tube sz 7.5		1	1	1	100%	1 each
	2	syringe, 20cc	endotracheal tube	1	1	1	100%	1 each
	2	syringe and needle, 5cc	thiopental and H2O	1	1	1	100%	1 each
	2	syringe and needle, 2cc	other drugs	1	24	24	100%	1 each
	2	syringe and needle, 10mm		1	1	1	100%	1 each
	2	IV set	saline & dextrose 5%	1	1	1	100%	1 each
	2	canullae	saline & dextrose 5%	1	1	1	100%	1 each
	2	gloves, non-sterile		1	1	1	100%	1 pair
	2	swabs, small ratex, 4" x 4"		1	10	10	100%	0
	2	swabs, abdominal, large		1	5	5	100%	roll of 36" x 10 yards
	2	plastic bags, leakproof, large		3	1	3	100%	1 each
	2	paper masks		1	1	1	100%	1 each
	2	paper caps		1	1	1	100%	1 each
	2	elastoplast, roll		1	1	1	100%	roll of 3"
	2	adhesive tape, roll		0.1	1	0	100%	roll of 1" x 10 yards
	2	measuring jug		0.004	1	0	100%	1 each
	2	KY jelly, tube		1	1	1	100%	tube of 4.2 g
	2	spirit, methylated, 250ml		1	1	1	100%	5000ml
	2	syringe and needle, 2cc	oxytocin	1	1	1	10%	1 each
	2	blood giving set	blood	1	1	1	4%	1 each

Haemorrhage

Haemorrhage					Category:	Postnatal Care				
		Expected Cases:	649							
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
APH & PPH	1	OXYTOCIN	IV	10	IU	amp	1	1	100%	OXYTOCIN:10IU/ML:1/AMP:INJ
	1	SODCHL:1000/ML:VIAL:IV	IV	3000	ml	bottle	3	1	100%	SODCHL:1000/ML:VIAL:IV
	1	PLASMA	IV	500	ml	bottle	3	1	20%	PLASMA
	1	BLOOD	IV	1	unit	bottle	3	1	100%	BLOOD
	Note:									

Haemorrhage								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
APH & PPH	1	syringe and needle, 2cc		1	1	1	100%	1 each
	1	IV set		1	3	3	100%	1 each
	1	canullae		1	3	3	100%	1 each
	1	blood giving set		1	3	3	100%	1 each

Puerperal sepsis

Pueperal Sepsis						Category:	Postnatal Care				
		Expected Cases:	433								
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
first line	1	PENICILLIN, G SODIUM	IV	4	MU	Vial	4	7	100%	PENG:1MU/VIAL:INJ
	1	METRONIDAZOLE SUSPENS	IV	500	mg	Vial	3	7	100%	METRONID:500MG/VIAL:INJ
	1	DEXTROSE	IV	1000	ml	Bottle	3	7	100%	DEXTROSE:5%/ML:1000bottle
	1	PARACETAMOL	PO	1000	mg	Tablet	3	3	100%	PARACET:500MG/TAB:TAB
second line	2	GENTAMICIN SULFATE	INJ	40	mg	Amp	3	7	20%	GENTAMIC:40MG/ML:1/AMP:INJ
	2	PENICILLIN, G SODIUM	IV	4	MU	Vial	4	7	20%	PENG:1MU/VIAL:INJ
	2	METRONIDAZOLE SUSPENS	IV	500	mg	Vial	3	7	20%	METRONID:500MG/VIAL:INJ
	2	DEXTROSE	IV	1000	ml	bottle	3	7	20%	DEXTROSE:5%/ML:1000bottle
	2	PARACETAMOL	PO	1000	mg	Tablet	3	3	20%	PARACET:500MG/TAB:TAB

Note:

Pueperal Sepsis								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
first line	1	IV set	Metrondazole	1	3	3	100%	1 each
	1	IV set	Dextrose	1	3	3	100%	1 each
	1	syringe and needle, 5cc	Penicillin sodium	1	28	28	100%	1 each
	1	canullae	Metronidazole/Dextrose	1	3	3	100%	1 each
second line	2	IV set	Metronidazole	1	3	3	20%	1 each
	2	IV set	Dextrose	1	3	3	20%	1 each
	2	canullae	Metronidazole/Dextrose	1	3	3	20%	1 each
	2	syringe and needle, 5cc	Penicillin	1	28	28	20%	1 each
	2	syringe and needle, 5cc	Gentamycin	1	21	21	20%	1 each

Neonatal sepsis

Neonatal Sepsis				Category:		Postnatal Care				
		Expected Cases:	433							
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
first line	1	GENTAMICIN SULFATE	IV	6.25	mg	amp	3	5	50%	GENTAMIC:40MG/ML:1/AMP:INJ
	1	SODIUM CHLORIDE	IV	250.00	ml	bottle	1	5	50%	SODCHL:1000/ML:VIAL:IV
second line	1	CIPROFLOXCIN	IV	50	mg	amp	1	5	50%	CIPROFLX:500MG/TAB:TAB
	1	DEXTROSE	IV	250	ml	bottle	1	5	50%	DEXTROSE:5%/ML:1000/bottle

Note:	

Neonatal Sepsis								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
first line	1	syringe and needle, 5cc	Gentamycin	1	15	15	50%	1 each
	1	IV set	Normal saline	1	3	3	50%	1 each
	1	canullae	Normal saline	1	3	3	50%	1 each
second line	1	syringe and needle, 5cc	Coprofloxcin	1	5	5	50%	1 each
	1	IV set	Dextrose 5%	1	3	3	50%	1 each
	1	canullae	Dextrose 5%	1	3	3	50%	1 each

Mastitis

Mastitis				Category:		Postnatal Care				
		Expected Cases:	433							
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
first line	2	AMOXYCILLIN	PO	500	mg	tab	3	5	80%	AMOXYCIL:500MG/TAB:PO
	2	PARACETAMOL	PO	1000	mg	tab	3	3	80%	PARACET:500MG/TAB:TAB
second line	2	CLOXACILLIN SODIUM	INJ	500	mg	vial	4	5	20%	CLOXACIL:500MG/VIAL:INJ
	2	LIDOCAINE HCL	SC	5	ml	vial	1	1	20%	LIDOC:1%/ML:50/VIAL:INJ
	2	METRONIDAZOLE	PO	400	mg	tab	3	5	20%	METRONID:200MG/TAB:TAB

	Note:	

Mastitis								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
incision & dra?	2	syringe and needle, 5cc	Lidocaine	1	1	1	20%	1 each
	2	scalpel blade ss 23		1	1	1	20%	1 each
	2	swabs, small ratex, 4" x 4"		1	7	7	20%	0
	2	adhesive tape, roll		0.01	5	0	20%	roll of 1" x 10 yards

Family planning

Family Planning				Category:		Family Planning				
		Expected Cases:	151,598							
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
Hormonal	1	MICOGYNON	PO	1	cycle	tab	1	13	34.8%	MICROGYN:LEVONORGESTREL/ETHINYL ESTRODIAL
	1	MICROLUT	PO	1	cycle	tab	1	13	12.2%	MICROLUT
	1	MEDROXYPROGESTERON	INJ	150	mg	vial	1	4	1.0%	MEDROXYPROGESTERONE:150MG/ML:INJ
	1	NORISTERAT	INJ	200	mg	amp	1	6	10.7%	NORISTERAT:200MG/ML
	1	PC4	PO	1	dose	tab	1	1	0.0%	PC4
Norplant	2	NORPLANT	SC	1	set	caps	1	0.25	0.7%	NORPLANT:38MG/CAPS
	2	LIDOCAINE HCL	IV	10	cc	vial	1	0.25	0.7%	LIDOC:1%/ML:50/VIAL:INJ
Barrier	1	CONDOM, MALE	VAG	1	unit	unit	1	150	28.9%	CONDOM, MALE
	1	CONDOM, FEMALE	VAG	1	unit	unit	1	150	0.5%	CONDOM, FEMALE
	1	VAGINAL FOAM	VAG	1	dose	tab	1	150	0.2%	VAGFOAM CONCEPTROL
IUD	1	IUD	VAG	1	unit	unit	1	0.25	4.4%	IUD

Family Planning								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
Injectable Depo Provera	1	syringe and needle, 1cc	Medroxyprogesterone Acetate	1	4	4	1.0%	1 each
	1	cotton wool	Medroxyprogesterone Acetate	2	4	8	1.0%	ball
Norplant	2	syringe and needle, 2cc		2	0.25	1	0.7%	1 each
	2	gloves, sterile		1	0.25	0	0.7%	1 pair
	2	scalpel blade ss 23		1	0.25	0	0.7%	1 each
	2	swabs, small ratex, 4" x 4"		2	0.25	1	0.7%	0
	2	adhesive tape, roll		0.04	0.25	0	0.7%	roll of 1" x 10 yards
	2	cotton wool		1	0.25	0	0.7%	ball
IUD	1	gloves, non-sterile		1	0.25	0	4.4%	1 pair
	1	gloves, sterile		1	0.25	0	4.4%	1 pair
	1	cotton wool		3	0.25	1	4.4%	ball
Injectable Noristerat	1	syringe and needle, 1cc		1	6	6	10.7%	1 each
	1	cotton wool		2	6	12	10.7%	ball

Vasectomy

Vasectomy				Category:	Family Planning				
		Expected Cases:	0						
Note	Level of Care	Drug	Route	Treatment Dose	Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
	2	LIDOCAINE HCL	IV	10 cc	vial	1	1	100%	LIDOC:1%/ML:50/VIAL:INJ
	2	PARACETAMOL	PO	500 mg	tablet	1	4	100%	PARACET:500MG/TAB:TAB

	Note:

Vasectomy								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins	Total Quantity	% Cases Treated	Supply Pack Size
	2	syringe and needle, 1cc	Lidocaine	1	1	1	100%	1 each
	2	scalpel blade sz 23		1	1	1	100%	1 each
	2	sutures, silk 2/0		1	1	1	100%	1 each
	2	adhesive tape, roll		0.04	1	0	100%	roll of 1" x 10 yards
	2	gloves, sterile		1	1	1	100%	1 pair
	2	cotton wool		1	1	1	100%	ball

Tubal ligation

Tubal Ligation				Category:	Family Planning				
		Expected Cases:	0						
Note	Level of Care	Drug	Route	Treatment Dose	Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
		LORAZEPAM	IV	4 mg	amp	1	1	100%	LORAZEPAM:4MG/AMP:INJ
		LIDOCAINE HCL	IV	10 ml	vial	1	1	100%	LIDOC:1%/ML:50/VIAL:INJ
		PARACETAMOL	PO	500 mg	tablet	4	1	100%	PARACET:500MG/TAB:TAB
	Note:								

Tubal Ligation								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins	Total Quantity	% Cases Treated	Supply Pack Size
		syringe and needle, 1cc	Lorazepam	1	1	1	100%	1 each
		syringe and needle, 5cc	Lidocaine	1	1	1	100%	1 each
		scalpel blade sz 23		1	1	1	100%	1 each
		sutures, silk 2/0		3	1	3	100%	1 each
		adhesive tape, roll		0.04	1	0	100%	roll of 1" x 10 yards
		swabs, small ratex, 4" x 4"		1	1	1	100%	0
		gloves, sterile		1	1	1	100%	1 pair
		gloves, non-sterile		1	1	1	100%	1 pair
		cotton wool		4	1	4	100%	ball
		spirit, methylated, 250ml		1	1	1	100%	5000ml

Genital ulcer disease

Genital Ulcer Disease						Category:	STD				
		Expected Cases:	20,828								
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation	
	1	BENZATHINE PENICILLIN	IM	2.4	MU	vial	1	3	100%	BENZATHINE PEN:24MEGA/VIAL/INJ	
	1	ERYTHROMYCIN	PO	500	mg	tablet	4	7	100%	ERYTHROM:250MG/TAB:TAB	
	Note:										

Genital Ulcer Disease								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
	1	syringe and needle, 5cc	Benzathine penicillin	1	3	3	100%	1 each

Vaginal discharge without pain

Vaginal Discharge without pain				Category:		STD				
		Expected Cases:	18,474							
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
	1	METRONIDAZOLE	PO	400	mg	1	3	10	100%	METRONID:200MG/TAB:TAB
	1	KANAMYCIN	IM	1	g	1	1	1	100%	KANAMYC:1GM/VIAL:INJ
	1	TETRACYCLINE HCL CAP	PO	500	mg	1	4	10	100%	TETRACYC:250MG/TAB:TAB
	Note:									

Vaginal Discharge without pain								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
		syringe and needle, 5cc	Kanamycin	1	15	15	100%	1 each

Vaginal discharge with pain

Vaginal discharge with pain					Category:	STD				
		Expected Cases:	10,746							
Note	Level of Care	Drug	Route	Treatment Dose		Unit	Times/ Day	# Days	% Cases Treated	Drug Formulation
first line	1	CIPROFLOXCIN	PO	500	mg	tablet	1	1	10%	CIPROFLX:500MG/TAB:TAB
second line	1	SPECTINOMYCIN	INJ	2	g	vial	1	1	90%	SPECTINOMYCIN:2G/VIAL:VIAL
		TETRACYCLINE HCL	PO	500	mg	tablet	4	10	90%	TETRACYC:250MG/TAB:TAB
		METRONIDAZOLE	PO	400	mg	tablet	3	10	90%	METRONID:200MG/TAB:TAB
	Note:									

Vaginal discharge with pain								
Note	Level of Care	Supply Item	Name of Associated Drugs (if IM or IV)	Quantity/ Admin.	# Admins.	Total Quantity	% Cases Treated	Supply Pack Size
second line	1	syringe and needle, 5cc	Spectinomycin	1	1	1	90%	1 each

Annex C: Estimated National Caseload

As the first step for estimating current caseload for selected reproductive health conditions included in the assessment, the current number of cases seeking care at health facilities in Zambia was estimated based on the latest available data at national level. When no information was available for particular condition, the study team attempted to estimate a number using the data obtained from the CES survey at sample facilities. Data were very scarce for puerperal and neonatal sepsis and mastitis at national and facility levels as their occurrences are not usually recorded in the routine medical information system. Gross estimation was attempted for these conditions using 1% as an arbitrary proportion of women with these conditions. As for vasectomy and tubal ligation, the prevalence data in men and women were available from the 1996 Zambia DHS, but no information was available on the annual number of procedures. The estimated caseload and sources are listed in the following table.

Estimated Number of Cases Currently at Facilities in Zambia

Category	Condition	Best Estimate	Note	Source
Current Reproductive Experience				
total births		332,318	9.8 millionx1998 estimated crude birth rate 33.91/1000	CSO
	occurring in health facility	154,528	46.5% of births	ZDHS 1996
	receiving any ANC	311,714	93.8% of pregnant women covered by ANC	ZDHS 1996
	women aged 15-49	2,156,000	22% of population	CBOH
Morbidity for all Treated Conditions				
Antenatal Care	Basic Antenatal Care	311,714	93.8% of pregnant women covered by ANC	ZDHS 1996
Antenatal Care	Antenatal Treatment	72,318	National average prevalance applied to ANC women	CSO/MOH1995
Deliveries	Clean & safe delivery	154,528	Total births occuring at health facilities	ZDHS 1996
Family Planning	Family planning	541,422	Based on total CYPs in 1998	DFID 1999
Deliveries	Lacerations & Episiotomy	28,937	Data (18.7% of delivery) from 6 samples applied to facility births	
Antenatal care	Pre-Eclampsia/Eclampsia	1,545	Assume 1% of births	
Deliveries	C-Section	12,517	Survey data (8.1% of delivery) applied to facility births	
Postnatal care	Pueperal Sepsis	1,545	Assume 1% of births	
Postnatal care	Neonatal Sepsis	1,545	Assume 1% of births	
Deliveries	Haemorrhage	2,333	Survey data (1.5% of delivery) applied to facility births	
Postnatal care	Mastitis	1,545	Assume 1% of births	
STD	Genital Ulcer Disease	74,382	Survey data (3.5%) applied to women aged 15-49	
STD	Vaginal discharge Without Pain	65,974	Survey data (3.1%) applied to women aged 15-49	
STD	Vaginal Discharge with pain	38,377	Survey data (1.8%) applied to women aged 15-49	
Family Planning	Vasectomy		0.1% of men 15-59, but annual case # unknown	ZDHS 1996
Family Planning	Tubal ligation		1.4% of women 15-49, but annual case # unknown	ZDHS 1996

Annex D: Estimated Caseload in 11 Sample Districts

District level demographic and morbidity data were not available for most of the target conditions included in this assessment. In most instances, therefore, reported or estimated national rates were applied to the total population in the 11 districts, with the exception of malaria incidence data. Estimated caseloads and other population data are summarized in the following tables.

Table 1. Estimated number of cases at facilities in 11 sample districts

Current caseload in 11 ZIHP districts				
Category	Condition	Best Estimate	Note	Source
Current Reproductive Experience				
total births		93,049	28% of national estimates based on the population	
	occurring in health facility	43,268	assume same as national	
	receiving any ANC	87,280	assume same as national	
	women aged 15-49	603,712	assume same as national	
Morbidity for All Treated Conditions				
Antenatal Care	Basic Antenatal Care	87,280	assume same as national	
Antenatal Care	Antenatal Treatment	29,466	Average mlaria incidence rate from 11 districts (33.8% among population)	CSO/MOH1995
Deliveries	Clean & safe delivery	43,268	assume same as national	CBOH/HMIS
Family Planning	Family planning	151,598	assume same as national	
Deliveries	Lacerations & Episiotomy	8,091	assume same as national	
Antenatal care	Pre-Eclampsia/Eclampsia	433	assume same as national	
Deliveries	C-Section	3,505	assume same as national	
Postnatal care	Pueperal Sepsis	433	assume same as national	
Postnatal care	Neonatal Sepsis	433	assume same as national	
Deliveries	Haemorrhage	653	assume same as national	
Postnatal care	Mastitis	433	assume same as national	
STD	Genital Ulcer Disease	20,828	assume same as national	
STD	Vaginal discharge Without Pain	18,474	assume same as national	
STD	Vaginal Discharge with pain	10,746	assume same as national	
Family Planning	Vasectomy		0.1% of men 15-59, but annual case # unknown	ZDHS 1996
Family Planning	Tubal ligation		1.4% of women 15-49, but annual case # unknown	ZDHS 1996

Table 2. Population in 11 districts as of March 4, 1999

Province	District	Population
Luapula	Mwense	103,083
	Samfya	145,225
Central	Kabwe	215,586
	Chibombo	192,666
Northern	Kasama	144,165
Copperbelt	Ndola	441,624
	Kitwe	467,084
Eastern	Lundazi	224,264
	Chipata	324,748
Southern	Kalomo	178,861
	Livingstone	95,246
6 Provinces	**11 Districts**	**2,744,144**

Source: ZIHP Office, Lusaka

Annex E: Medical Equipment Packages

The contents of three medical equipment packages are presented below. Italics in each indicate that prices for the items could not be found at the time of the study.

Basic antenatal care equipment

		Unit Prices		
Equipment Type	**# of Units**	**Local Median (Kwacha)**	**Local Median (US$)**	**Int'l Median (US$)**
Scale, adult	2	124,956	48.06	87.31
Stethoscope	2	39,000	15.00	3.96
Foetalscope	2	143,000	55.00	1.22
Syphgmomanometer	2	138,450	53.25	22.64
Tape measure	1	5,200	2.00	0.46
Thermometer	2	1,920	0.74	0.65
Gestational wheel	1	---	---	---
Microscope	1	5,456,906	2,098.81	1,956.52
Refrigerator	1	572,000	220.00	500.00
Carry cool box with ice pack	4	---	---	46.86
Couch	1	481,338	185.16	181.16
Ultrasound machine	1	---	---	---
Screen	1	---	---	---

US$1.00 = 2,600 Kwacha

Clean and safe delivery equipment package

US $1.00 = 2600 Kwacha

Equipment Type	# Unit			Unit Price		
	Labor/Delivery Unit	Ante-/Post-natal Unit	Total	Local Med	Local Med ($)	Int'l Med ($)
Autoclave	1		1	10,140,000	3,900.00	
Bed pans (plastic)	3		3	68,900	26.50	12.29
Cardiac-tocograph (CTG)	1		1		-	
Cots and mattress	3		3		-	
Couch	1		1	481,338	185.13	181.16
Delivery Bed	2		2	695,500	267.50	625.60
forceps, artery 8" curved	1		1	28,600	11.00	1.00
forceps, artery 8" straight	1		1	28,600	11.00	3.34
Forceps, artery small	1		1	*4,774*	1.84	1.84
Forceps, Cheatle with stand	1		1	45,500	17.50	1.65
Forceps, dissecting, nontoothed	1		1	31,434	12.09	1.02
Forceps, dissecting, toothed	1		1	32,144	12.36	0.99
Forceps, mosquito	1		1	*6,971*	2.68	2.68
Forceps, sponge holder	2		2	73,700	28.35	2.20
Gallipots, small & large	2		2	31,900	12.27	
Gestational wheel		1	1	-	-	-
Heater	1		1		-	
Kidney dish 10" stainless steel	1		1	20,904	8.04	2.10
Kidney stainless steel , small	1		1	57,122	21.97	2.19
Korckers	1		1	*7,220*	2.78	2.78
Laryngoscope, paedriatic	1		1	254,800	98.00	14.78
Needle holder 7"	1		1	33,358	12.83	3.45
Resuscitare	1		1	377,000	145.00	164.25
Scale adult	1	2	3	124,956	48.06	87.31
Scale, baby	1	2	3	265,642	102.17	7.10
scissors, cord 10 cm	1		1	29,900	11.50	1.70
Scissors,episiotomy 12.5cm	1		1	27,856	10.71	1.00
Sharps boxes	1		1		-	
Speculum vaginal, graves	1		1	70,165	26.99	4.35
Speculum, vaginal cuscos	1		1	70,165	26.99	4.86
Speculum, vaginal simms	1		1	70,165	26.99	4.83
Sphygmomanometer	1	2	3	138,450	53.25	25.00
Sterilizer	1		1	9,173,866	3,528.41	
Stethoscope, adult	1	2	3	29,250	11.25	6.00
Stethoscope, foetal	1	2	3	48,500	18.65	12.50
Suction machine	1		1	2,501,486	962.11	190.82
Thermometer	2	2	4	1,920	0.74	0.28
Tongue depressor (wood)	1		1	30	0.01	0.43
Trolley (instrument)	1		1	620,178	238.53	
Ultrasound machine (portable)	1		1		-	

Obstetric surgery equipment package

US $1.00 = 2600 Kwacha

Equipment	# Units	Unit Price Local Med	Local Med ($)	Int'l Med ($)
Abdominal retractors	1		-	
Airway, small, medium, large	2	3,666	1.410	3.82
Ambu bag, baby	1	495,000	190.385	166.67
Ambu bag, adult	1	80,500	30.962	195.65
Blades handle	2		-	1.06
Blades (100)	2	27,645	10.633	4.40
Boots,non static gum (pair)	6	25,766	9.910	
Bowl, stainless steel, large	1	57,122	21.970	
Cribs and mattresses	1		-	
Currette, uterile double ended 7"	1	72,072	27.720	
Currette, uterile sharp ended 9"	1	72,072	27.720	
Dilator, Haggars uterine (sizes 3 - 16, set)	1		-	
Forceps, artery 8" straight	1	28,600	11.000	1.00
Forceps, artery chances (COF) 7"	5		-	1.65
Forceps, artery Kelly- Fraser (COF) 5"	10	20,202	7.770	2.68
Forceps artery Spencer wells 7"	5		-	1.02
Forceps, artery, Moynhans	5		-	2.77
Forceps, artery, roberts	5		-	2.77
Forceps, dissecting 7" toothed Lanes	7	15,600	6.000	1.50
Forceps, dissecting non- toothed, fine	5	31,434	12.090	1.50
Forceps, dissecting non-toothed, large	5	31,434	12.090	1.50
Forceps, dissecting toothed, fine	5	31,434	12.090	1.500
Forceps, dissecting toothed, large	5	32,144	12.363	1.670
Forceps, double toothed, teneculum	2		-	1.850
Forceps, rigglies	2		-	1.060
Forceps, ovum (9")	1		-	1.860
Forceps, needle holder, straight	3	33,358	12.830	3.450
Forceps, sponge holding	5	73,700	28.346	2.250
Forceps, sponge holding (Lamely or Forester) 9"	5	49,140	18.900	3.450
Forceps, tissue green armitage	5	14,248	5.480	2.650
Forceps, tissue, Allis	4	33,826	13.010	1.060
Forceps, uterine haemostatis, meggots	5		-	1.060
Forceps, uterine haemostatis, kochers	5	18,668	7.180	1.060
Forceps, valsellum (Hysterectomy) Trevors 9"	4		-	2.680
Gallipots, small	1	26,000	10.000	
Gallipots, medium	1	31,900	12.269	
Gas cylinder	1		-	
Handle, Bard parker size 3 and 4	2		-	0.966
Intestinal clamps, straight	2		-	
Intestinal clamps, curved (dry)	2		-	
Kidney dish, small	2	14,820	5.700	2.270
Laryngoscope	1	254,800	98.000	14.780
Macintosh, plastic sheet	1		-	
Scissors Mayo 61/2 straight	1	18,616	7.160	2.200
Scissors Mayo 61/2 curved	1	19,890	7.650	2.200
Pack, large & medium	2		-	
Retractor, doyens	1	201,448	77.480	
Retractor lagenback, medium	2	84,136	32.360	
Retractor lagenback, large	2	84,136	32.360	
Scissors, mayo curved	1	19,890	7.650	1.060
Scissors, straight	1	28,616	11.006	1.060
Scrub brush	3		-	0.966
Speculum, auvard 9"	1		-	8.450
Speculum, simms- small	1	70,165	26.987	8.450
Speculum,simms - medium	1	70,165	26.987	8.450
Speculum, simms large	1	70,165	26.987	8.450
Sphygnomanometer	1	138,450	53.250	25.000
Suction machine, anaesthetic	2	3,850,000	1,480.769	190.820
Suction cathetor with metal end	2	5,000	1.923	33.330
Theatre clothing - Gowns	6	64,168	24.680	
Theatre clothing - trousers and top	6	60,000	23.077	
Theatre clothing, Dresses	6	45,000	17.308	
Tray placenta	1	39,720	15.277	
Trolley (Instrument)	1	620,308	238,580	

Annex F: Health Care Providers Interviewed

Province	District	OBGYN	GP	CO	Registered Midwife	Enrolled Midwife	Public Health Nurse	Family Health Nurse	Registered Nurse	Enrolled Nurse	Other	TOTAL
Eastern	Lundazi		1	7	1	4		2	1	8	2	26
	Chipata		1	4	2	8		7		15	1	38
Central	Kabwe	1		3	2	2		2	1	7		18
	Chibombo			7	2	6			2	2	1	20
Northern	Kasama	1		5		2		4	1	8	2	23
Southern	Kalomo	1	1	1		2		2	2	7	2	18
	Livingstone	1		1	2	8	1	1	1	4		19
Copperbelt	Ndola	1	1	4	1	15			4	7		33
	Kitwe	1	1	5	3	8		3	3	7		31
Luapula	Mwense	2		2		4		2		6		16
	Samfya		1	7		3				3	4	18
TOTAL		8	6	46	13	62	1	23	15	74	12	260
		14			75				89			

Annex G: Postnatal Women Interviewed, by District

Province	District	# Postnatal women interviewed	% of total
CENTRAL	CHIBOMBO	2	2%
	KABWE	2	2%
COPPOER BELT	KITWE	14	15%
	NDOLA	9	10%
EASTERN	CHIPATA	12	13%
	LUNDAZI	15	16%
LUAPULA	MWEBE	3	3%
	SAMFYA	0	0%
NORTHERN	KASAMA	9	10%
SOUTHERN	KALOMO	13	14%
	LIVINGSTONE	14	15%
Total		**93**	

Annex H: Summary of Medical Equipment Needs in 11 Districts

Basic antenatal care equipment needs in 11 sample districts

Equipment Item	# Unit per package	SURVEY DATA # items available at facilities surveyed			COSTING MODEL DATA Total # required at facilities surveyed			GAP IN AVAILABILITY AT FACILITIES SURVEYED			TOTAL ADDITIONAL EQUIPMENT NEED IN ZIHP DISTRICTS		
		Hospital (n=14)	Health Center (n=139)	Total	Hospital (n=14)	Health Center (n=139)	Total	Hospital (n=14)	Health Center (n=139)	Total	Hospital (N=17)	Health Center (n=230)	TOTAL
Scale, Adult	2	30	148	178	76	460	536	46	312	358	53	567	620
Stethoscope	2	26	160	186	76	460	536	50	300	350	57	545	603
Foetal scope	2	46	322	368	76	460	536	30	138	168	34	251	285
Sphygmomanometer	2	28	142	170	76	460	536	48	318	366	55	578	633
Tape measure	1	7	41	48	38	230	268	31	189	220	35	344	379
Thermometer	2	47	190	237	76	460	536	29	270	299	33	491	524
Gestational wheel	1	6	9	15	38	230	268	32	221	253	37	402	438
Microscope	1	n/a	n/a	n/a	38	230	268	n/a	n/a	n/a	n/a	n/a	n/a
Refrigerator	1	9	86	95	38	230	268	29	144	173	33	262	295
Carry cool box with ice packs	4	n/a	n/a	n/a	152	920	1072	n/a	n/a	n/a	n/a	n/a	n/a
Couch	1	7	62	69	38	230	268	31	168	199	35	305	341
Ultrasound machine	1	n/a	n/a	n/a	38	230	268	n/a	n/a	n/a	n/a	n/a	n/a
Screen	1	n/a	n/a	n/a	38	230	268	n/a	n/a	n/a	n/a	n/a	n/a

n/a indicates items that were not included in the facility survey

Clean and safe delivery equipment needs in 11 sample districts

Item	# Unit per package	SURVEY DATA			COSTING MODEL DATA			GAP IN AVAILABILITY AT FACILITIES SURVEYED			TOTAL ADDITIONAL EQUIPMENT NEED IN ZIHP DISTRICTS		
		# items available at facilities surveyed			Total # required at facilities surveyed								
		Hospital (n=14)	Health Center (n=139)	TOTAL	Hospital (n=14)	Health Center (n=139)	TOTAL	Hospital (n=14)	Health Center (n=139)	TOTAL	Hospital (N=17)	Health Center (n=230)	TOTAL
Autoclave	1	4	16	20	30	230	260	26	214	240	30	389	419
Bed pans (plastic)	3	n/a	n/a	n/a	90	230	320	n/a	n/a	n/a	n/a	n/a	n/a
Cardiac-tocograph (CTG)	1	0	0	0	30	230	260	30	230	260	34	418	452
Cots and mattress	3	n/a	n/a	n/a	90	230	320	n/a	n/a	n/a	n/a	n/a	n/a
Delivery Bed	2	n/a	n/a	n/a	60	230	290	n/a	n/a	n/a	n/a	n/a	n/a
forceps, artery 8" curved	1	303	280	583	30	230	260	-273	-50	-323	-312	-91	-403
forceps, artery 8" straight	1	143	n/a	143	30	230	260	-113	n/a	-113	-129	n/a	-129
Forceps, artery small	1	n/a	n/a	n/a	30	230	260	n/a	n/a	n/a	n/a	n/a	n/a
Forceps, Cheatle with stand	1	n/a	n/a	n/a	30	230	260	n/a	n/a	n/a	n/a	n/a	n/a
Forceps, dissecting, nontoothed	1	0	0	0	30	230	260	30	230	260	34	418	452
Forceps, dissecting, toothed	1	0	0	0	30	230	260	30	230	260	34	418	452
Forceps, mosquito	1	20	96	116	30	230	260	10	134	144	11	244	255
Forceps, sponge holder	2	85	129	214	60	230	290	-25	101	76	-29	184	155
Gallipots, small & large	2	137	230	367	60	230	290	-77	0	-77	-88	0	-88
Heater	1	18	23	41	30	230	260	12	207	219	14	376	390
Kidney dish 10" stainless steel	1	n/a	n/a	n/a	30	230	260	n/a	n/a	n/a	n/a	n/a	n/a
Kidney stainless steel , small	1	n/a	n/a	n/a	30	230	260	n/a	n/a	n/a	n/a	n/a	n/a
Korckers	1	n/a	n/a	n/a	30	230	260	n/a	n/a	n/a	n/a	n/a	n/a
Laryngoscope, pediatric	1	n/a	n/a	n/a	30	230	260	n/a	n/a	n/a	n/a	n/a	n/a
Needle holder 7"	1	92	154	246	30	230	260	-62	76	14	-71	138	67
Resuscitare	1	7	16	23	30	230	260	23	214	237	26	389	415
Scale adult	3	28	93	121	90	230	320	62	137	199	71	249	320
Scale, baby	3	16	107	123	90	230	320	74	123	197	85	224	308
Scissors, cord 10 cm	1	49	72	121	30	230	260	-19	158	139	-22	287	266
Scissors, episiotomy 12.5cm	1	43	145	188	30	230	260	-13	85	72	-15	155	140
Sharps boxes	1	n/a	n/a	n/a	30	230	260	n/a	n/a	n/a	n/a	n/a	n/a
Speculum vaginal, graves	1	3	6	9	30	230	260	27	224	251	31	407	438
Speculum, vaginal cuscos	1	37	205	242	30	230	260	-7	25	18	-8	45	37
Speculum, vaginal simms	1	22	25	47	30	230	260	8	205	213	9	373	382
Sphygmomanometer	3	38	87	125	90	230	320	52	143	195	59	260	319
Sterilizer	1	19	61	80	30	230	260	11	169	180	13	307	320
Stethoscope, adult	3	29	108	137	90	230	320	61	122	183	70	222	292
Stethoscope, foetal	3	43	237	280	90	230	320	47	-7	40	54	-13	41
Suction machine	1	14	50	64	30	230	260	16	180	196	18	327	346
Thermometer	4	65	106	171	120	230	350	55	124	179	63	225	288
Tongue depressor (wood)	1	484	83	567	30	230	260	-454	147	-307	-519	267	-252
Trolley (instrument)	1	26	51	77	30	230	260	4	179	183	5	325	330
Ultrasound machine (portable)	1	n/a	n/a	n/a	30	230	260	n/a	n/a	n/a	n/a	n/a	n/a

Obstetric surgery equipment needs in 11 sample districts

Item	# unit per package	# items available at Hospitals surveyed (n=14)	Total # required at 14 hospitals estimated by the CES Model	Gap in availability at 14 hospitals	Total additional equipment need at 17 hospitals in ZIHP districts
Abdominal retractors	1	180	30	-150	-171
Airway, small, medium, large	2	115	60	-55	-63
Ambu bag, baby	1	16	30	14	16
Ambu bag, adult	1	n/a	30	n/a	n/a
Blades handle	2	58	60	2	2
Blades (100)	2	11	60	49	56
Boots, non static gum (pair)	6	43	180	137	157
Bowl, stainless steel, large	1	37	30	-7	-8
Cribs and mattresses	1	n/a	30	n/a	n/a
Curette, uterile double ended 7"	1	12	30	18	21
Curette, uterile sharp ended 9"	1	19	30	11	13
Dilator, Haggars uterine (sizes 3 - 16, set)	1	24	30	6	7
Forceps, artery 8" straight	1	143	30	-113	-129
Forceps, artery chances (COF) 7"	5	1	150	149	170
Forceps, artery Kelly- Fraser (COF) 5"	10	35	300	265	303
Forceps artery Spencer wells 7"	5	250	150	-100	-114
Forceps, artery, Moynhans	5	78	150	72	82
Forceps, artery, Roberts	5	n/a	150	n/a	n/a
Forceps, dissecting 7" toothed Lanes	7	104	210	106	121
Forceps, dissecting non- toothed, fine	5	39	150	111	127
Forceps, dissecting non-toothed, large	5	71	150	79	90
Forceps, dissecting toothed, fine	5	27	150	123	141
Forceps, dissecting toothed, large	5	121	150	29	33
Forceps, double toothed, teneculum	2	11	60	49	56
Forceps, rigglies	2	n/a	60	n/a	n/a
Forceps, ovum (9")	1	30	30	0	0
Forceps, needle holder, straight	3	197	90	-107	-122
Forceps, sponge holding	5	87	150	63	72
Forceps, sponge holding (Lamely or Forester) 9"	5	127	150	23	26
Forceps, tissue green armitage	5	110	150	40	46
Forceps, tissue, Allis	4	166	120	-46	-53
Forceps, uterine haemostatis, meggots	5	39	150	111	127
Forceps, uterine haemostatis, kochers	5	n/a	150	n/a	n/a
Forceps, valsellum (Hysterectomy) Trevors 9"	4	37	120	83	95
Gallipots, small	1	74	30	-44	-50
Gallipots, medium	1	18	30	12	14
Gas cylinder	1	n/a	30	n/a	n/a
Handle, Bard parker size 3 and 4	2	95	60	-35	-40
Intestinal clamps, straight	2	n/a	60	n/a	n/a
Intestinal clamps, curved (dry)	2	n/a	60	n/a	n/a
Kidney dish, small	2	66	60	-6	-7
Laryngoscope	1	23	30	7	8
Scissors Mayo 61/2 straight	1	28	30	2	2
Scissors Mayo 61/2 curved	1	29	30	1	1
Pack, large & medium	2	68	60	-8	-9
Retractor, doyens	1	48	30	-18	-21
Retractor lagenback, medium	2	83	60	-23	-26
Retractor lagenback, large	2	n/a	60	n/a	n/a
Scissors, mayo curved	1	45	30	-15	-17
Scissors, straight	1	31	30	-1	-1

Item	# unit per package	# items available at Hospitals surveyed (n=14)	Total # required at 14 hospitals estimated by the CES Model	Gap in availability at 14 hospitals	Total additional equipment need at 17 hospitals in ZIHP districts
Scrub brush	3	17	90	73	83
Speculum, auvard 9"	1	20	30	10	11
Speculum, simms- small	1	7	30	23	26
Speculum, simms- medium	1	18	30	12	14
Speculum, simms large	1	15	30	15	17
Sphygmomanometer	1	n/a	30	n/a	n/a
Suction machine, anaesthetic	2	15	60	45	51
Suction catheter with metal end	2	12	60	48	55
Theatre clothing – Gowns	6	225	180	-45	-51
Theatre clothing - trousers and top	6	315	180	-135	-154
Theatre clothing, Dresses	6	123	180	57	65
Tray placenta	1	7	30	23	26
Trolley (Instrument)	1	29	30	1	1
Uterine sound graduated, 12" double ended	1	3	30	27	31
Uterine sound graduated, 12" single ended	1	36	30	-6	-7
Vacuum extractor, manual	1	3	30	27	31
Yankaur, suction nozzle	1	14	30	16	18

Annex I: Estimated National Commodity Needs

Estimated annual national equipment needs (in US$)

No.	Equipment	Internat. Unit Price	Quantity	Total Cost
1	Scale, Adult	6.31	950	5,994.50
2	Stethoscope	3.96	900	3,564.00
3	Foetal scope	1.22	300	366.00
4	Sphygmomanometer	22.64	650	14,716.00
5	Tape measure	0.46	400	184.00
6	Thermometer	0.65	850	552.50
7	Gestational wheel		450	0.00
8	Refrigerator	500.00	295	147,500.00
9	Couch	181.16	350	63,406.00
10	Ultrasound machine		200	0.00
11	Autoclave	3900.00	450	1,755,000.00
12	Forceps, dissecting, nontoothed	1.02	450	459.00
13	Forceps, dissecting, toothed	0.99	450	445.50
14	Forceps, mosquito	2.68	250	670.00
15	Forceps, sponge holder	2.20	200	440.00
16	Heater	50.00	400	20,000.00
17	Needle holder 7"	3.45	150	517.50
18	Resuscitare	164.25	450	73,912.50
19	Scale, baby	7.10	300	2,130.00
20	Scissors, cord 10 cm	1.70	300	510.00
21	Scissors (episiotomy) 12.5cm	1.00	150	150.00
22	Speculum vaginal, graves	4.35	450	1,957.50
23	Speculum, vaginal cuscos	4.86	50	243.00
24	Speculum, vaginal simms	4.83	400	1,932.00
26	Sterilizer	3528.41	350	1,234,943.50
27	Stethoscope, foetal	5.57	100	557.00
28	Suction machine	190.82	350	66,787.00
29	Tongue depressor (wood, 100)	0.43	300	129.00
30	Trolley (instrument)	238.53	330	78,714.90
31	Ambu bag, baby	166.67	20	3,333.40
32	Blades handle	1.00	100	100.00
33	Blades (100)	4.40	100	440.00
34	Boots, non-static gum (pair)	50.00	200	10,000.00
35	Curette, uterile double ended 7"	2.50	20	50.00
36	Curette, uterile sharp ended 9"	2.65	20	53.00

No.	Equipment	Internat. Unit Price	Quantity	Total Cost
37	Dilator, Haggars uterine (sizes 3 - 16, set)	5.00	10	50.00
38	Forceps, artery chances (COF) 7"	1.65	200	330.00
39	Forceps, artery Kelly- Fraser (COF) 5"	2.65	300	795.00
40	Forceps, artery, Moynhans	2.77	100	277.00
41	Forceps, dissecting 7" toothed Lanes	1.50	150	225.00
42	Forceps, dissecting non- toothed, fine	1.50	150	225.00
43	Forceps, dissecting non-toothed, large	1.50	100	150.00
44	Forceps, dissecting toothed, fine	1.50	150	225.00
45	Forceps, dissecting toothed, large	1.67	50	83.50
46	Forceps, double toothed, teneculum	1.85	50	92.50
47	Forceps, sponge holding	2.25	100	225.00
48	Forceps, sponge holding (Lamely or Forester) 9"	3.45	50	172.50
49	Forceps, tissue green armitage	2.65	50	132.50
50	Forceps, uterine haemostatis, meggots	1.06	150	159.00
51	Forceps, valsellum (Hysterectomy) Trevors 9"	1.06	100	106.00
52	Gallipots, medium	12.00	20	240.00
53	Laryngoscope	14.78	10	147.80
54	Scissors Mayo 61/2 straight	2.20	10	22.00
55	Scissors Mayo 61/2 curved	2.20	10	22.00
56	Scrub brush	0.96	100	96.00
57	Speculum, auvard 9"	8.45	10	84.50
58	Speculum, simms- small	8.45	30	253.50
59	Speculum, simms – medium	8.45	20	169.00
60	Speculum, simms large	8.45	20	169.00
61	Suction machine, anaesthetic	190.82	50	9,541.00
62	Suction catheter with metal end	33.33	60	1,999.80
63	Theatre clothing – Gowns	56.00	100	5,600.00
64	Tray placenta	12.00	30	360.00
66	Uterine sound graduated, 12" double ended	1290.05	40	51,602.00
67	Vacuum extractor, manual	505.00	30	15,150.00
68	Yankaur, suction nozzle	45.00	20	900.00
				3,579,362.40

Estimated annual national drug needs (in US$)

No.	Drug	Dosage	Unit	Int. Unit Price	Total Amt.	Total Cost
1	Atropine sulfate	1 mg/ml	Ampoule	0.0964	15,000	1,446.00
2	Benzathine penicillin	2.4 MU	Vial	0.2660	270,000	71,820.00
3	Chloroquine phosphate	250mg(150mg base)	1000 tablets	6.6000	12,000	79,200.00
4	Ciprofloxacin	500 mg	Tablet	0.9338	4,800	4,482.24
5	Dextrose	5%/ml	1000 ml bottle	0.8800	67,200	59,136.00
6	Dextrose in ml saline	5%/ml	1000 ml vial	0.8800	42,000	36,960.00
7	Diazepam	5mg/ml (2ml)	Ampoules	0.0824	600	49.44
8	Ergometrine maleate	500mcg/ml	Ampoules	0.1098	186,000	20,422.80
9	Erythromycin	250 mg	1000 tablets	31.3000	600	18,780.00
10	Ferrous sulfate	200 mg/tab	1000 tablets	0.8000	222,000	177,600.00
11	Folic acid	5 mg	1000 tablets	0.7000	74,400	52,080.00
12	Gentamycin sulfate	40mg/ml (2ml)	Ampoule	0.1126	168,000	18,916.80
13	Hydralazine	20 mg	Ampoule	0.4406	360	158.62
14	Kanamycin	1g/vial	Vial	0.2800	79,200	22,176.00
15	Lidocaine (Lignocane) hcl	1%ml(10)	Vial	0.1100	36,000	3,960.00
16	Magnesium sulfate	50% injection	Ampoule	0.1210	1,800	217.80
17	Mebendazole	100 mg	1000 tablets	6.8000	2,400	16,320.00
18	Methyldopa	250 mg	100 tablet	2.0340	3,120	6,346.08
19	Metronidazole infusion	100 mg/ml	Ampoule	0.4700	42,000	19,740.00
20	Neostigmine	2.5 mg/ml (1ml)	Ampoule	0.1662	15,000	2,493.00
21	Nifedipine	10mg	1000 tablet	4.1000	600	2,460.00
22	Oxytocin	10IU/ml (1ml)	Ampoule	0.3685	3,000	1,105.50
23	Pancuronium bromide	2 mg/ml	Ampoule	4.4125	15,000	66,187.50
24	Paracetamol	500 mg	1000 tablet	2.5000	4,800	12,000.00
25	Penicillin G sodium	1 MU	Vial	0.1940	62,400	12,105.60
26	Pethidine	50mg/ml (2ml)	Vial	0.3196	90,000	28,764.00
27	Promethazine	25mg/ml (2ml)	Ampoule	0.0960	45,600	4,377.60

No.	Drug	Dosage	Unit	Int. Unit Price	Total Amt.	Total Cost
28	Quinine hydrochloride	300mg/ml (2ml)	Vial	0.8000	390,000	312,000.00
29	Sodium chloride	1000 ml	Bottle	3.3369	120,000	400,428.00
30	Sterile water	10 ml	Vial	0.0245	6,000	147.00
31	Sulphadoxine + pyrimethamine	525 mg	Tablet	0.0966	30,000	2,898.00
32	Suxamethonium cl	50mg/ml (2ml)	Ampoule	0.0770	30,000	2,310.00
33	Tetanus Toxoid vaccine	1 dose	Ampoule	0.0400	744,000	29,760.00
34	Tetracycline hcl	1%/3.5g tube	Tube	0.0106	186,000	1,971.60
35	Tetracycline hcl	250 mg	Capsules	8.4000	6,600	55,440.00
36	Thiopental	1g/vial	Vial	0.2850	15,000	4,275.00
37	Vitamin A	200000 IU	Capsules	0.0228	186,000	4,240.80
						1,552,775.38

Estimated annual national medical supply needs (in US$)

No.	Medical supply	Unit	Unit Price	Quantity	Total Cost
1	Adhesive tape, roll	Roll of 1x10yd	1.20	860	1,032.00
2	Antenatal record	Each	0.10	151,360	15,136.00
3	Blood transfusion set	Each	0.3137	17,200	5,395.64
4	Canullae	Each	0.32	86,000	27,520.00
5	Cord clamp	Each	0.097	151,360	14,681.92
6	Cotton wool	Roll	1.13	103,200	116,616.00
7	Elastoplast, roll	roll of 3	1.20	1,720	2,064.00
8	Endotracheal tube size 7.5	Each	2.053	13,760	28,249.28
9	Glass tube, blood, red top	Each	2.295	151,360	347,371.20
10	Glass tube, capillary	100 tubes	1.44	1,513.6	2,179.58
11	Hypochloride	Litre	2.13	15,136	32,239.68
12	IV set	Each	0.128	103,200	13,209.60
13	KY jelly, tube	tube of 5g	0.215	860	184.90
14	Lancet	Each	0.018	550,400	9,907.20
15	Macintosh sheeting	Each	0.1545	77,400	11,958.30
16	Measuring jug	Each	5.00	516	2,580.00
17	Paper caps	Each	20.30	6,028.6	122,380.58
18	Paper masks	Each	20.30	6,028.6	122,380.58
19	Plastic bags, leakproof, large	Each	0.06	17,200	1,032.00
20	RPR kit	Each	25.27	1,513.6	38,248.67
21	Scalpel blades sz 23	Each	0.10	12,040	1,204.00
22	Spirits 250ml	Litre	0.07	860	60.20
23	Sterile gloves	Pair	0.25	151,360	37,840.00
24	Suction catheter sz 10	Each	0.20	77,400	15,480.00
25	Sutures, chromic catgut 1 or 2	Each	0.909	60,200	54,721.80
26	Sutures, silk 2/0	Each	0.73	20,640	15,067.20
27	Swabs, abdominal large 12x12	roll 36 x 100yd	1.6951	860	1,457.79
28	Swabs, small ratex, 4x4	pack of 20	1.27	860	1,092.20
29	Syringe 20 cc	box of 100	6.529	258	1,684.48
30	Syringe and needle, 2cc	box of 100	4.84	3,440	16,649.60
31	Syringe and needle, 5cc	box of 100	4.55	12,040	54,782.00
32	Urine dipsticks	bottle of 100	3.32	1,513.60	5,025.15
					1,119,431.56

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