Implications of Health Sector Reform for Contraceptive Logistics

A Preliminary Assessment for Sub-Saharan Africa

FPLM

FPLM

The Family Planning Logistics Management (FPLM) project is funded by the Office of Population of the Bureau for Global Programs, Field Support and Research of the U.S. Agency for International Development (USAID). The agency's Contraceptives and Logistics Management Division provides a centralized system for contraceptive procurement, maintains a database on commodity assistance, and supports a program for contraceptive logistics management.

Implemented by John Snow, Inc. (JSI) (contract no. CCP-C-00-95-00028-00), and subcontractors (The Futures Group International and the Program for Appropriate Technology in Health [PATH]), the FPLM project works to ensure the continuous supply of high-quality health and family planning products in developing countries. FPLM also provides technical management and analysis of two USAID databases, the contraceptive procurement and shipping database (NEWVERN) and the Population, Health, and Nutrition Projects Database (PPD).

Recommended Citation

Bates, James, Yasmin Chandani, Kathryn Crowley, John Durgavich, and Sandhya Rao. 2000. *Implications of Health Sector Reform for Contraceptive Logistics: A Preliminary Assessment for Sub-Saharan Africa.* Arlington, Va.: Family Planning Logistics Management/John Snow, Inc., for the U.S. Agency for International Development (USAID).

Abstract

This paper synthesizes the results of country studies carried out to assess the impact of health sector reform (HSR) on public sector contraceptive logistics systems in four sub-Saharan Africa countries (Zambia, Ghana, Kenya, and Tanzania). Using both qualitative and quantitative methods, the analysis tested two hypotheses: (1) vertically managed contraceptive logistics systems are effective means for ensuring product availability and service to family planning clients, and (2) health sector reform programs can disrupt contraceptive logistics operations. The results show that both hypotheses are valid. Concerning the second hypothesis, it is important to note that while HSR may be disruptive, it is also associated with positive changes. The paper concludes with 25 recommendations that will help HSR planners and implementers avoid past mistakes and take advantage of positive experiences.

FPLM
Family Planning Logistics Management
John Snow, Inc.
1616 North Fort Myer Drive, 11th Floor
Arlington, VA 22209 USA
Phone: 703-528-7474
Fax: 703-528-7480
E-mail: fplm_project@jsi.com
Internet: www.fplm.jsi.com

Contents

Executive Summary xi

1. Introduction 1
   - Rationale 1
   - Objectives 2
   - Analytical Framework 2
   - Hypotheses and Methods 3
   - Contents of this Report 3

2. Health Logistics Management 5
   - The Logistics Cycle 5
   - Vertical and Integrated Logistics Systems 5
   - Logistics Functions 7

3. Health Sector Reform 11
   - Characteristics 11
   - HSR and Logistics Management 12
   - Integration 12
   - Decentralization 13
   - Cost Recovery 13
   - Privatization 14

4. Findings 17
   - Status of Variables 17
   - Influence of Health Sector Reform on Logistics 18
   - Influence of Other Factors on Logistics 25

5. Conclusions and Recommendations 29
   - Conclusions 29
   - Recommendations 30

Appendix A. Family Planning Context: Demand, Supply, and Unmet Need 35

Appendix B. Study Protocol 39

Appendix C. District-Level Data Collection Instrument Adapted for Zambia 49

Appendix D. Summary of Health Sector Reforms, by Country 83

Appendix E. Summary of Variables for Ghana 93

Appendix F. Summary of Variables for Kenya 99

Appendix G. Summary of Variables for Tanzania 103

Appendix H. Summary of Variables for Zambia 109

Appendix I. Summary of Variables, by Country 115

Appendix J. Contraceptive Availability and CPR by Country 119

Appendix K. Estimated Values of Donor Contributions for Contraceptive Logistics for 1998 in USD . 121
Notes 123
References 127

Tables

A-1. Past, Current, and Projected Future Contraceptive Prevalence Levels, by Country 35
A-2. Current and Projected Number of Contraceptive Users, by Country 36
A-3. Percentage of Past, Current, and Projected Modern-Method Prevalence, by Country 37
A-4. Percentage of Unmet Need for Spacing and Limiting Methods, by Country 37
A-5. Percentage of Public-Sector Provision of Reversible Contraceptives, by Country 38
B-1. Definitions of Indicators for Variables of Analysis 43
D-1. Selected Aspects of Health Sector Reform, by Country 84

Figures

1. Analytical Framework for Study 2
2. The Logistics Cycle 5
3. Vertical Logistics Systems 6
4. An Integrated Logistics System 7
5. A Typical Distribution System 9
B-1. Analytical Framework for Study 40
D-1. Timeline of Health Sector Reform, by Country 83
J-1. Ghana: Trends in Contraceptive Stockouts and Contraceptive Prevalence, 1993–1999 119
J-2. Kenya: Trends in Contraceptive Stockouts and Contraceptive Prevalence, 1989–1998 119
J-3. Tanzania: Trends in Contraceptive Stockouts and Contraceptive Prevalence, 1991–1999 120
J-4. Zambia: Trends in Contraceptive Stockouts and Contraceptive Prevalence, 1992–1996 120

Acronyms

CBOH	Central Board of Health (Zambia)
CCLU	Contraceptive Commodities Logistics Unit (Zambia)
CLM	Contraceptive Logistics Management Division
CMS	central medical store
CPR	contraceptive prevalence rate
DANIDA	Danish International Development Agency
DFID	British Department for International Development
DGIS	Netherlands Development Assistance Agency
DHB	District Health Board
DHMT	District Health Management Team
DMS	district medical store
DRP	distribution resource planning
EDL	essential drug list
EDP	essential drug package
ESP	essential services program
FH	family health
FPLM	Family Planning Logistics Management
GOBI	growth-monitoring, oral rehydration therapy, breastfeeding, and immunization
GHS	Ghana Health Services (Ghana)
HIV/AIDS	human immunodeficiency virus/acquired immunodeficiency syndrome
HMIS	health management information system
HSR	health sector reform
ICPD	International Conference on Population and Development
IPPF	International Planned Parenthood Federation
JSI	John Snow, Inc.
KEMSA	Kenya Medical Supplies Association
KfW	Kreditanstalt für Wiederaufbau
LMIS	logistics management information system
MOH	Ministry of Health
MSCU	Medical Supplies Coordinating Unit
MSD	Medical Stores Department
MSL	Medical Stores Limited (Zambia)
NGO	nongovernmental organization
NHIF	National Hospital Insurance Fund (Kenya)
NORAD	Norwegian Agency for Development Cooperation
ORS	oral rehydration salts
PATH	Program for Appropriate Technology in Health
PHC	primary health care
PPD	Population, Health, and Nutrition Projects Database
RCHS	Reproductive and Child Health Section (Tanzania)
RDF	revolving drug fund
RMS	regional medical store
RVS	regional vaccine store (Tanzania)
SDP	service delivery point
SIDA	Swedish International Development Agency
SNV	Netherlands Development Organization
SSD	Services Support Division (Zambia)

SSDM	Stores, Supplies, and Drug Management (Ghana)
STI	sexually transmitted infection
SWAp	sector wide approach
TB	tuberculosis
UCI	universal child immunization
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Acknowledgments

This paper, *Implications of Health Sector Reform for Contraceptive Logistics: A Preliminary Assessment for Sub-Saharan Africa*, culminates 22 months of work that began in December 1998. Along the way, many people have made important contributions. Without the support of USAID Washington's Contraceptive Logistics Management (CLM) Division, this project would not have been started. CLM Division Chief John Crowley and FPLM Project Manager Mark Rilling have been patient reviewers of incremental outputs at every step of the way. Other groups without whose support this paper would not exist include the staff of USAID Offices of Population and Health in Zambia, Ghana, Kenya, and Tanzania, and, most important, Ministry of Health (MOH) counterparts in all four countries. Anyone who has done similar work knows that no study can succeed without the support and guidance of these counterparts.

The literature review, study design, field work, preparation of country cases, and analysis of data were carried out by a diverse team of specialists from the FPLM project and The Futures Group International. Participating from FPLM were James Bates, Yasmin Chandani, Jennifer Crandall, Kathryn Crowley, John Durgavich, Makiko Kinoshita, Steve Kinzett, Paula Nersesian, Nosa Orobaton, Norbert Pehe, Sandhya Rao, and Timothy Rosche. Participating from The Futures Group were Christina Fowler, Scott Moreland, and Janet Smith.

The study team wishes to make a special acknowledgment of the contribution of our friend and colleague, Janet Smith, who passed away on Easter Sunday 2000. Janet was instrumental in carrying out the literature review and developing the study design. Even after illness took her from the workplace, Janet remained active, reviewing the country cases and making helpful suggestions. We miss her dearly.

Executive Summary

This paper reports on a study assessing the impact of health sector reform programs on contraceptive logistics and product availability in four sub-Saharan countries. Its importance derives from the critical role that family planning plays in preventive health care, the effective role that vertically managed contraceptive logistics systems play in making products available to clients, and the reported disruptive effects that health sector reform has had on contraceptive logistics. Four health sector reform innovations that can significantly affect logistics have become worldwide trends—integration, decentralization, cost recovery, and privatization.

The purpose of this paper is to disseminate the results of the study to policymakers, health sector reform planners, and health sector reform implementers so that they can profit from positive developments and avoid mistakes. The specific objectives were:

- To understand how HSR is affecting nine variables, including contraceptive availability and specific logistics functions such as logistics management information systems (LMIS), financing, product selection, forecasting, procurement, storage, transport, and human resources.

- To investigate associations between HSR and logistics, and to compare these relationships across countries, showing similarities and differences and making general conclusions and recommendations.

The study achieves its objectives using an eight-step method that enables comparisons across countries. By means of this method, the study analyzes qualitative and quantitative data to document, within the context of health sector reform, the status of the nine variables listed above. Essential drug logistics is also considered for purposes of comparison.

Using this comparative method, the study tests two hypotheses:

- Vertical contraceptive logistics systems are effective means for improving service to clients by improving product availability.

- Health sector reform innovations can disrupt specific logistics functions.

Results of the analysis confirm that both hypotheses are valid. However, the relationships between health sector reform and public-sector logistics operation are complex. It is often difficult to determine the causes of specific developments. And, although health sector reform can be disruptive to logistics operations, it can also be helpful. The results do identify many problems resulting from health sector reform, but they do not support a blanket condemnation of the effects of reform on contraceptive logistics.

The study finds the status of the variables to be relatively consistent across countries. The most important findings are that, (1) over defined periods of health sector reform, contraceptive availability has improved, and that (2) this trend is attributable not to health sector reform, but rather to continuity of donor financing and persistence of vertical logistics management. Based on these and other findings, the study presents three conclusions:

1. Vertical contraceptive logistics systems are an effective means for improving service to clients by improving product availability.

2. Health sector reform can be disruptive for certain logistics functions, but it can also have positive effects.

3. To assure good logistics system performance, it is important for host country staff and donors to pay sufficient attention to the many details of logistics system design and implementation when planning and carrying out health sector reform.

The final part of the paper makes 25 recommendations for policymakers and health sector reform planners and implementers. The purpose of the recommendations is to help governments and donors involved in developing HSR programs to plan the details of implementation with a specific focus on logistics. Through advance preparation based on these recommendations, HSR planners and implementers can avoid negative results, benefit from positive experiences and increase the likelihood that the following basic goal of HSR will be achieved: "Strategic and fundamental change throughout national health systems for the purpose of improving the quality, equity, access and financial sustainability of health services."

1. Introduction

Rationale

Throughout the 1990s, increasing numbers of developing countries have been implementing health sector reform (HSR) programs, to improve the equity, access, quality, and financial sustainability of health services. Consortia of bilateral donors, multilateral agencies, and development banks have supported the reforms, which often bring about significant changes in the financing, structure, and support systems of ministries of health (MOH). Among the many operations affected by HSR is contraceptive logistics; indeed, some reforms are aimed directly at the logistics systems to improve efficiency and better support priority services.

However, many countries report difficulties in contraceptive logistics management as a direct or indirect result of well-intentioned health sector reform activities. Of greatest concern are low-income countries that have embarked on HSR programs. In sub-Saharan Africa, for example, the current average contraceptive prevalence rate (CPR) for modern methods is only 18 percent (PRB 2000). These low-prevalence countries desperately need the benefits of well-functioning logistics systems to ensure the availability of contraceptives for clients at all times. These countries, however, are the ones least able to handle the complexities of effective contraceptive logistics management, especially where system operations are complicated or have been compromised by the effects of health sector reform.

Some advocates of increased contraceptive coverage believe that maintenance of pre-reform vertical contraceptive logistics systems is a proven means to ensure contraceptive availability and good service to family planning clients, and that certain key elements of health sector reform threaten contraceptive availability. Among these is the integration of contraceptives and drugs into a single system or decentralization of planning and budgetary decision making.

Projections developed by The Futures Group International indicate that there is a growing unmet need among family planning clients in these countries for contraceptives distributed through the public sector. This increasing demand can only add to the logistics burden these countries face. More information on family planning supply, demand, and unmet need in the countries studied appears in appendix A.

The USAID Family Planning Logistics Management project (FPLM), managed by John Snow, Inc. (JSI), has been providing technical assistance for contraceptive logistics to developing countries since 1986. As a result of the increasing numbers of anecdotes about the potentially harmful effects of HSR on contraceptive availability, FPLM carried out case studies in four countries between July 1999 and June 2000: Zambia, Ghana, Kenya, and Tanzania. The purpose of the case studies was to gather evidence on the effects of HSR on contraceptive logistics management. This paper synthesizes the results of the country case studies. The hope is that policymakers, planners, and line managers who work within the context of HSR will benefit from positive developments and avoid mistakes that could adversely affect availability of contraceptives and other public health products. This is the group to whom the recommendations in the final section of the paper are addressed.

Objectives

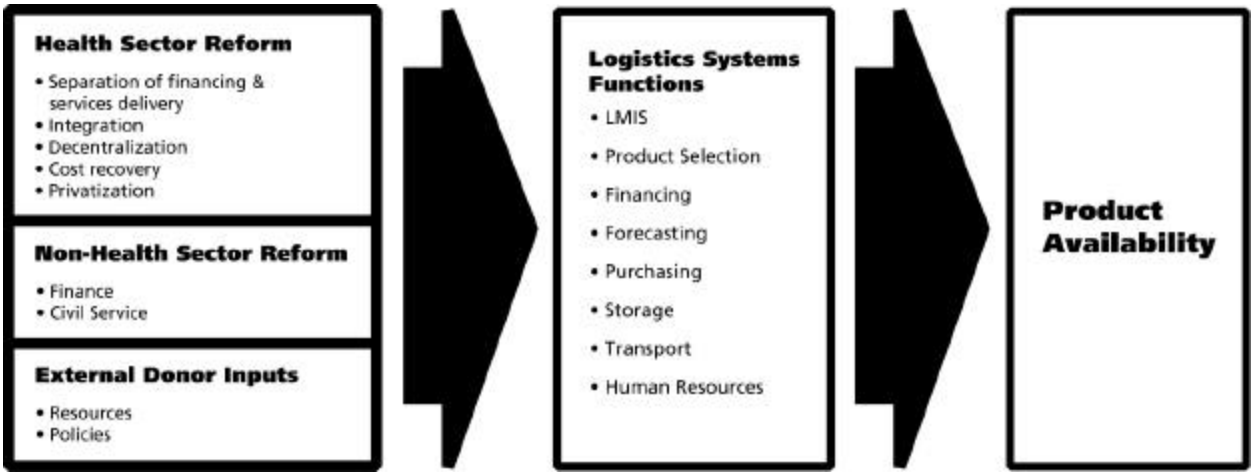
The objectives of this comparative study are:

- To understand how HSR is affecting contraceptive availability and specific logistics functions, such as logistics management information systems (LMIS), financing, product selection, forecasting, procurement, storage, transport, and human resources.
- To investigate associations between HSR and logistics, and to compare these relationships across countries, showing similarities and differences and making general conclusions and recommendations.

Analytical Framework

Figure 1 illustrates the analytical framework for this study. Independent variables are listed on the left: HSR program content, non-HSR reforms, and donor policies and resources. Dependent variables are shown in the two boxes to the right; they are the eight logistics functions listed for the first objective, plus product availability, making nine altogether.

Figure 1.
Analytical Framework for Study



The horizontal arrows represent the main axes of inquiry. They represent the relationships, borne out by the study findings, between independent and dependent variables, based on the following assumptions:

- Over defined periods of HSR, in given country contexts, the dependent variables will change.
- Some of the changes in the dependent variables may be plausibly associated with HSR. These associations can be supported by study findings.
- Some of the changes in the dependent variables may be related to non-HSR factors.

With regard to the dependent variables, the focus of this study is on contraceptive logistics. Noncontraceptive logistics systems, particularly those for essential drugs, also receive attention to draw comparisons with contraceptive logistics systems.

Hypotheses and Methods

This study tests two hypotheses:

- Vertical contraceptive logistics systems are effective means for improving service to clients by improving product availability.
- Health sector reform innovations can disrupt specific logistics functions.

The study did not test these hypotheses in a statistically significant manner. Rather, it used a convenience sample of countries, regions, districts, and service delivery points (SDP) to gather qualitative and quantitative data on a set of 40 prespecified indicators.

The study team used an eight-step method to collect data for the purpose of enabling comparisons across countries:

1. Development of a generic study protocol that was tailored to fit country-specific contexts (appendix B). It outlines the country selection criteria, information sources, data analysis methods and indicators.
2. Specification of quantitative and qualitative indicators of logistics system performance, based on the dependent variables described in table B-1.
3. Review of relevant health sector reform and logistics-related literature for each country.
4. Development of generic data collection instruments, subsequently pilot-tested in each country and modified to fit situational contexts. The district-level instrument adapted for Zambia is given in appendix C.
5. In-country data collection in Zambia, Ghana, Kenya, and Tanzania.
6. Preparation of individual case studies for all four countries.
7. Creation of summary tables. The tables in appendix D distill the periodicity and content of each country's HSR program, and the tables comprising appendices E–H provide qualitative information and descriptive statistics for each dependent variable for each country.
8. Preparation of a synthesis table showing the dependent variables and the indicator results for each country. This table (appendix I) provides the basis for the findings.

Contents of this Report

Section 2 provides a generic summary of public-sector health logistics management as it is typically practiced in Anglophone sub-Saharan Africa. It discusses the four-step logistics cycle, the separate functions that make up each step, and the difference between vertical and integrated logistics systems.

Section 3 outlines the major types of health sector reform activities relevant to this study and discusses how these reform activities are likely to affect logistics management.

Section 4 lays out the findings of the study and includes a summary of indicator results across countries and an analysis of the influence of HSR innovations on the eight logistics functions selected as dependent

variables, plus product availability, the goal of a logistics system. It also discusses the critical influence of non-HSR factors.

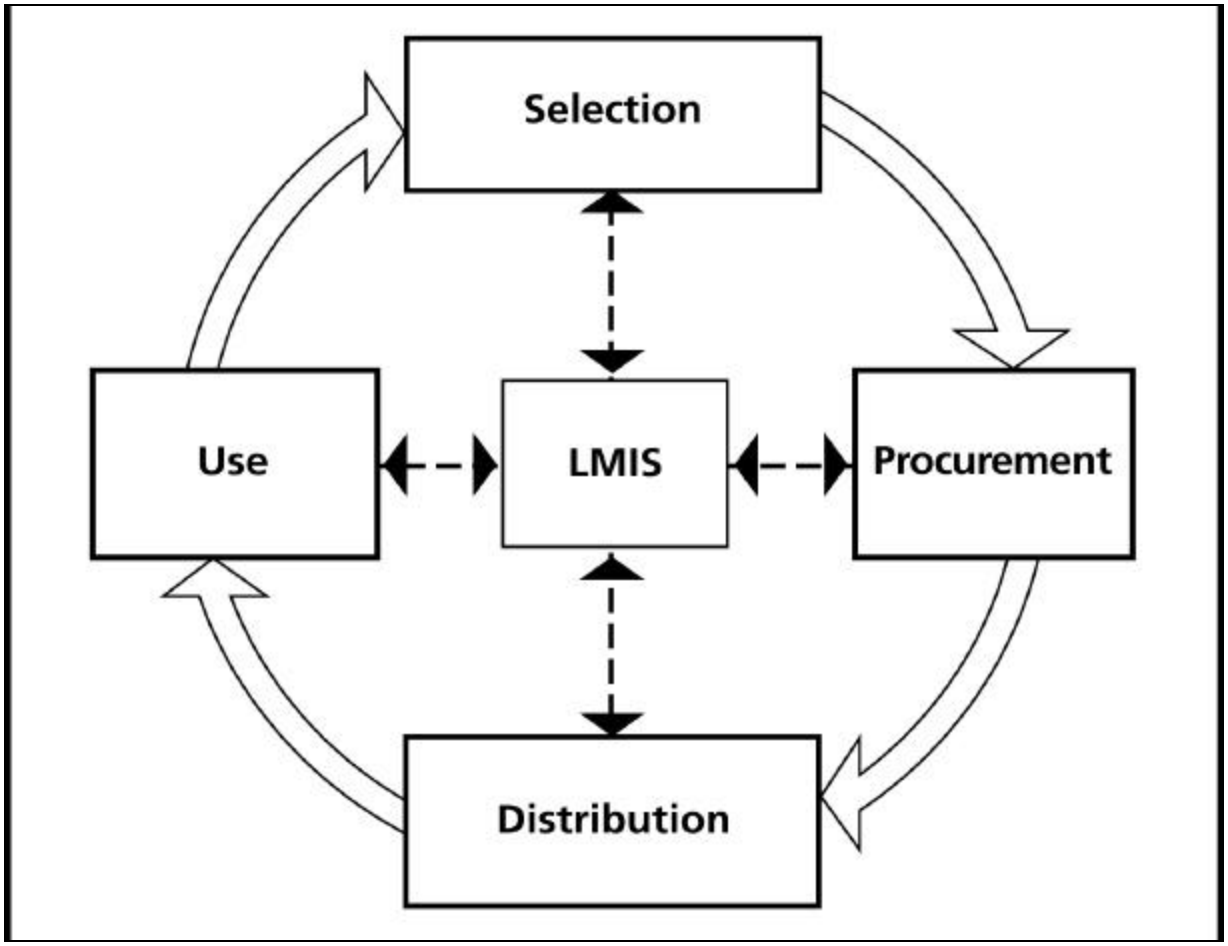
Finally, section 5 provides conclusions and recommendations for policymakers, planners, and country managers on protecting contraceptive availability within the context of an HSR program.

2. Health Logistics Management

The logistics process in developing countries is typically conceptualized as a cycle of four basic steps: product selection, procurement, distribution, and use (figure 2).

The Logistics Cycle

Figure 2.
The Logistics Cycle



For any logistics system to succeed, the decisions at each step must be based on up-to-date and accurate information. Logistics managers drive the cycle from step to step by making decisions using the information that the LMIS provides.

Vertical and Integrated Logistics Systems

Important variations exist across countries in the structure of logistics systems handling different categories of supplies. For the purposes of this paper, the vertically managed logistics system and the integrated logistics system are the two most relevant.

A vertical system is one in which the steps of the logistics cycle are carried out separately for each service program. Thus, there are more or less independently operating systems for family planning, primary health care, control of diarrheal diseases and acute respiratory infections, malaria, tuberculosis, leprosy, nutrition, HIV/AIDS, and immunization. In general, there are also separate procurement offices, warehouses, and transport arrangements for each program's products. In countries receiving development assistance, vertical systems have predominated over the past 30 years.

An integrated system is one in which, as much as possible, the separate steps of the logistics cycle are carried out for all products within one system. Thus, one office coordinates procurement for all programs, and all products are stored in the same warehouse and distributed through the same transport arrangements.

Figures 3 and 4 compare the structures of a vertical and an integrated logistics system. It is important to remember that these two types seldom exist in a pure form. There are usually some integrated operations, even when a vertical system predominates, and some vertical management of certain functions persists when systems are integrated. In other words, vertical and integrated logistics system can, and often do, exist side by side in the same country. The best example of such coexistence is the vaccine distribution system that, because of its special requirements for cold chain storage equipment, usually retains a high degree of vertical management, even after other logistics systems are integrated.

Figure 3.
Vertical Logistics Systems

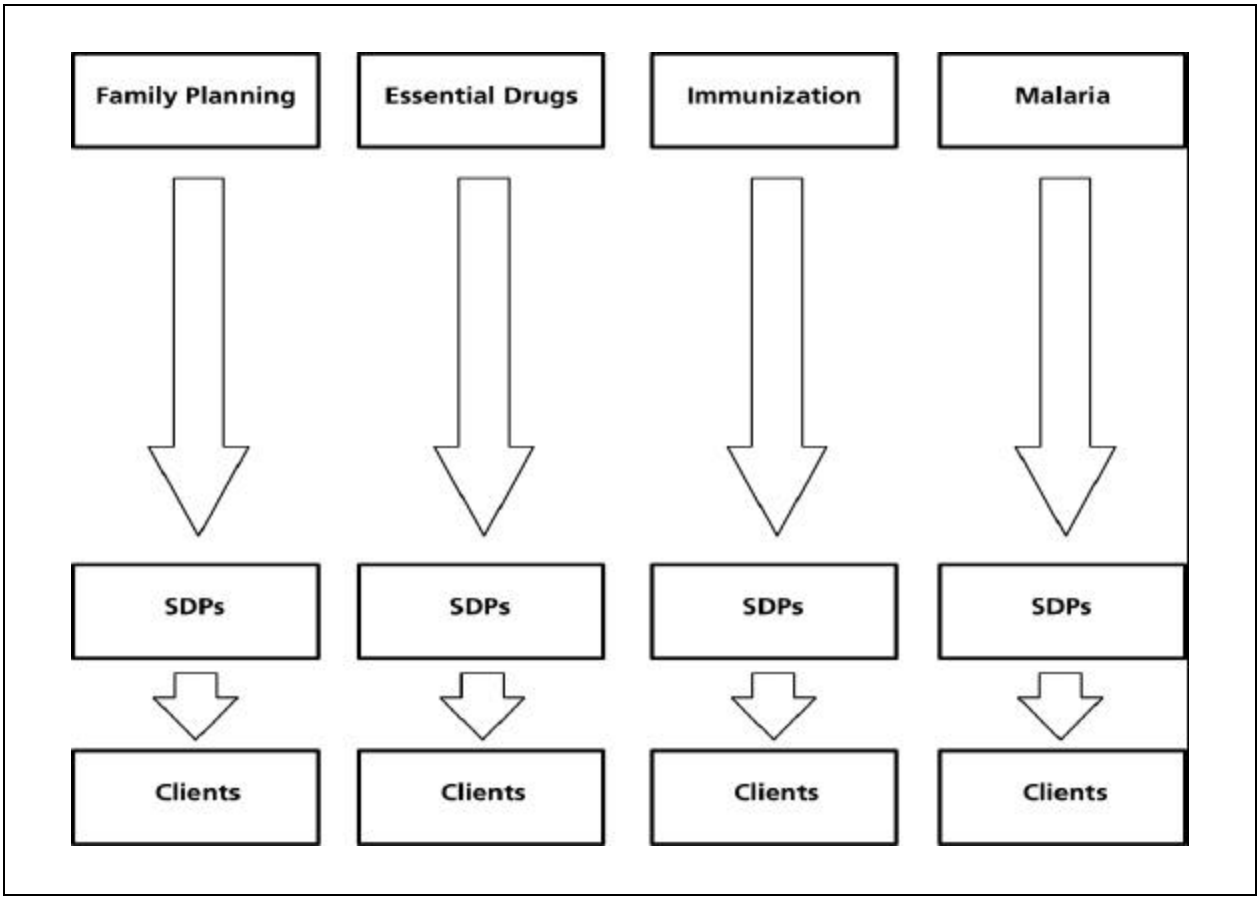
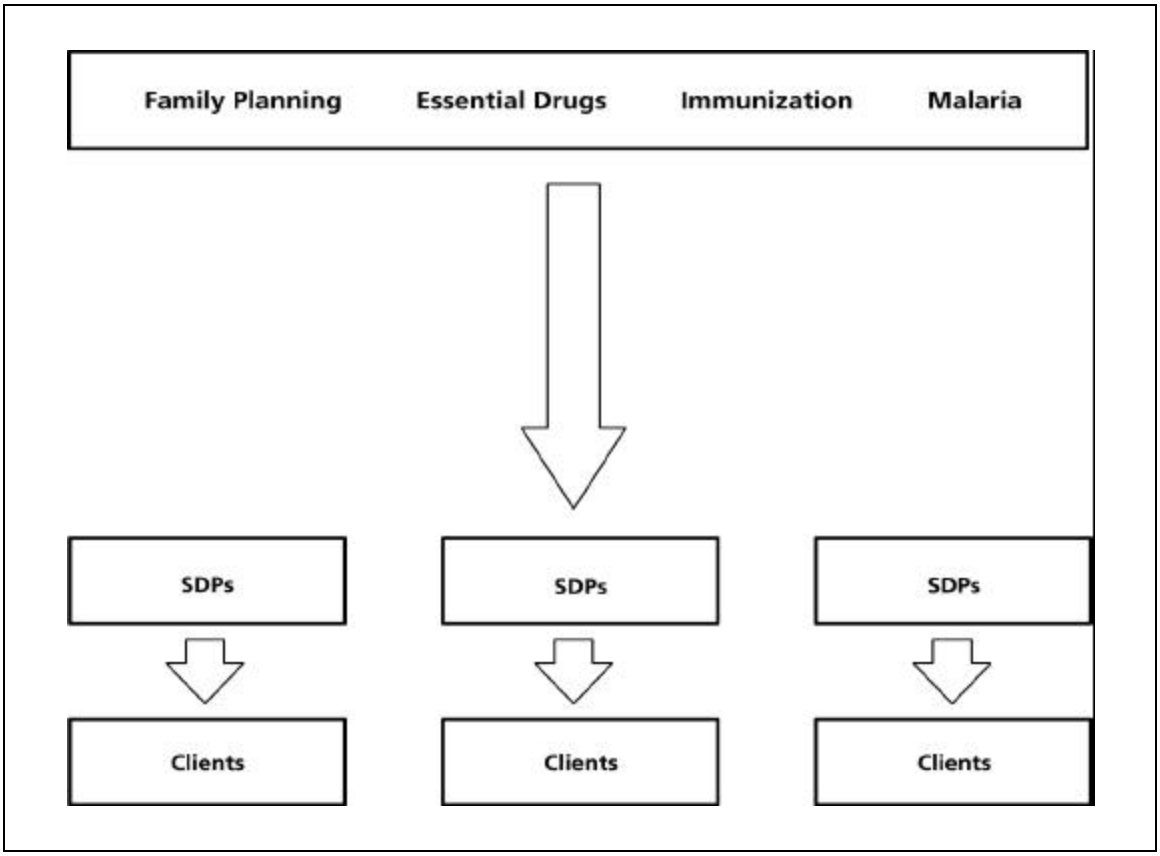


Figure 4.
An Integrated Logistics System



Logistics Functions

Whether a logistics system is vertical or integrated, each step of the logistics cycle is made up of a sequence of substeps, or functions. The most important functions are described below.

LMIS

A logistics management information system, or "LMIS," is the combination of forms and the procedures required for gathering and organizing logistics data. The most important data are the quantities of each product dispensed to users, stock positions, and losses throughout the system. An LMIS moves these data from the SDPs up through the district or regional levels to the central level of the system. An LMIS provides the basis for forecasting, determining purchase quantities, adjusting stock positions at each warehouse and SDP, monitoring loss rates, and identifying irrational use. It is the backbone of any logistics system, providing vital information required for supply chain management.

A logistics management information system should not be confused with a health management information system (HMIS). An HMIS gathers information on vital registration (birth and death records), service statistics (facility utilization rates, types and numbers of health problems treated), surveillance data, and financial and management data. Although an HMIS may track the stock status of 10 to 20 indicator products deemed most essential for good service, it does not provide the essential data for quantities dispensed to users, stock positions, and losses. In addition, an HMIS usually gathers and processes data more slowly than an LMIS does. Year-old HMIS reports on facility utilization rates or

health problems are still useful for most decision making. However, if an LMIS report is so much as a month or a quarter out of date, it is useless for many of the operational decisions a contraceptive logistics manager needs to make. Still, LMIS and HMIS do need to relate to one another. For example, they should use common codes for SDPs and common names and specification for products.

Product Selection

Product selection covers the compilation and revision of the national essential drug list (EDL) and the compilation of program-specific product lists. Contraceptives are often, but not always, on an EDL. (Of course, they are always on the list for a family planning or reproductive health program.) Although contraceptives and drugs may be managed by different service delivery programs and logistics systems, the criteria for selecting these products are the same: relevance to health problems, plus proven efficacy, quality, safety, and affordability. Many ministries of health (MOH) have regulations that confine routine procurement of these commodities to products on the official lists.

Procurement

Procurement covers forecasting needs, financing, quantifying products to be purchased, advertising for and evaluating tenders and selecting the most suitable suppliers, awarding contracts, paying suppliers, and clearing customs.

Financing is a uniquely significant function of the logistics procurement process. Middle-income countries such as India, China, and Brazil provide for themselves most of the contraceptives they consume. This is not the case, however, for low-income countries, including those discussed in this study. For such countries, donor grants have been the most important source for financing contraceptive procurements. Recently, the role of development bank credits has grown significantly. In some countries—Zambia, for example—one donor is the predominant funder of contraceptives. In others, such as Ghana, Kenya, and Tanzania, a number of donors play significant roles.

Typically, country staff provide the donors with information on the types and quantities of products required. The donors, through their own agents, manage the international segments of the supply pipelines (i.e., purchase and transport of the products to the recipient's port of entry or central warehouse). The MOH manages the in-country segments (i.e., storage and distribution). This paper focuses on the in-country segments of contraceptive logistics systems.

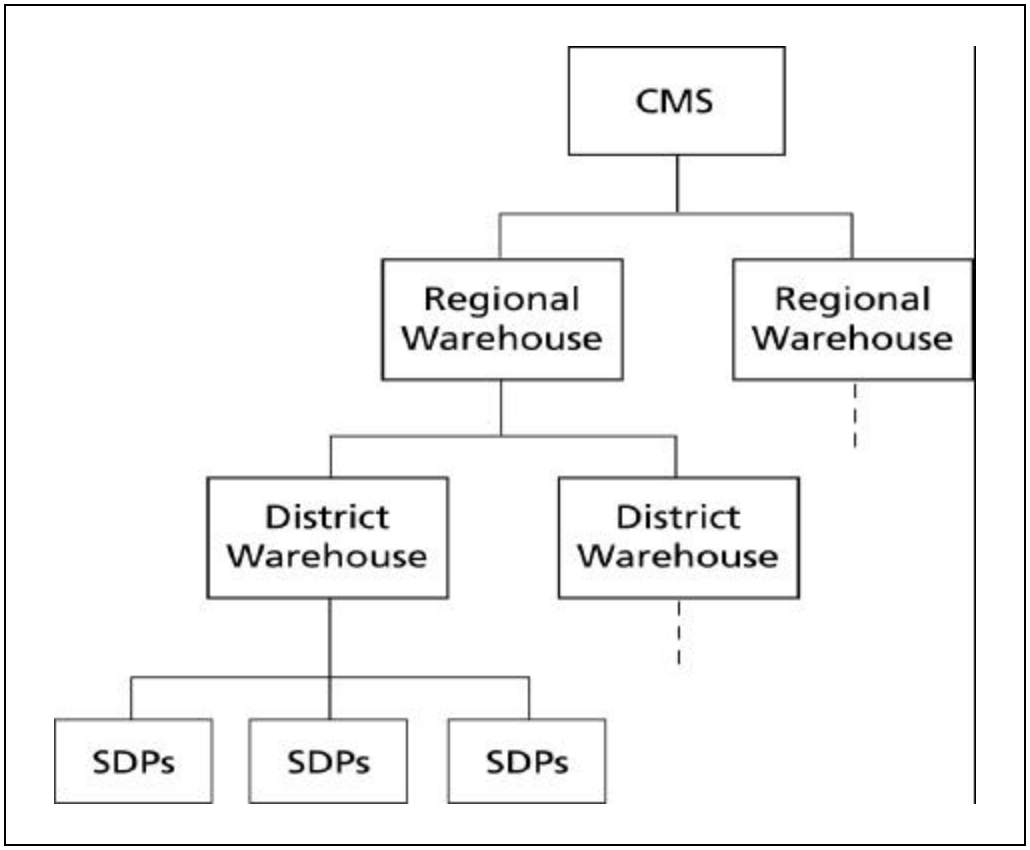
Procurement of essential drugs in most countries is quite different from the relatively simple process for contraceptives. MOHs are usually involved much more directly in drug purchases than they are for contraceptive purchases. As noted, contraceptives are mostly donor-financed and donor-purchased, and, in most cases, the concerned donors who finance contraceptive purchases manage the purchases themselves. Drugs, however, tend to have a number of funding sources. The most important are country budgets, donors, and development bank credits. When country budget funds are involved, the health ministry itself manages drug purchases. For bilateral donor funds, drug purchases may be donor- or MOH-managed. In the case of development bank credits, the ministry manages the procurement process, although in some cases the MOH appoints procurement agents.

Another important difference between procurement of contraceptives and essential drugs is the number of products involved. The contraceptive method mix typically ranges from four to eight products. Essential drug lists can contain 200 to 400 products; even a pared-down list for primary health care may have over 100 products. Obviously, it is more difficult to quantify, tender, purchase, and ensure quality for 100 products than for 8 products.

Distribution

A distribution system consists of a network of storage facilities linked by transport. In most developing countries, the distribution system is pyramidal, with the central medical store (CMS) at the apex and SDPs or community outlets at the base. In between are one or more intermediate storage facilities such as regional warehouses or district warehouses or both (figure 5).

Figure 5.
A Typical Distribution System



The most important activities subsumed under storage are storekeeping and inventory control. Storekeeping entails providing shelter secure from theft, moisture, and pests, plus receiving, organizing, storing, controlling, and issuing stock. The inventory control strategy, a closely related function, refers to a plan for maintaining predetermined quantities at each level of the distribution system. Conceptually, storage and inventory control are separate functions, but, for convenience, they are discussed together. Typically, contraceptive stock positions at warehouses and SDPs are expressed in terms of months, with the number of months to be kept at each level determined by the frequency of deliveries. For example, SDPs that receive stock from the district warehouse every month may have maximum stock levels averaging two months' consumption and minimum stock levels averaging one month's consumption.

Transport refers to the physical distribution of stock down through the storage network. The most common means of transport are delivery by a truck fleet managed by the central warehouse; delivery by a private third party contracted to provide transport services to lower-level storage facilities; and districts and SDPs using their own vehicles or public transport to pick up supplies at higher levels.

In contrast to procurement, there are fewer significant differences between distribution of contraceptives and distribution of essential drugs. Although specific procedures may vary within multiple vertical logistics systems in a country, most distribution activities are carried out for both product categories in about the same way.

There is, however, one very important difference between contraceptive distribution and drug distribution *as actually practiced.* When it comes to contraceptives, donors have been willing to fund the procurement of supplies sufficient to meet demand. This means that a contraceptive logistics manager can use inventory control strategies that rely on minimum and maximum (min/max) stock positions at each level of the logistics system. Depending on such factors as geography, transport resources, and delivery intervals, the manager can then adjust stock positions in warehouses and SDPs in a way that reduces the chance of a stockout and minimizes inventory holding costs.

Drug logistics managers cannot do the same. Although some funders have been willing or able to provide full supplies of selected drugs such as oral rehydration salts (ORS) or vitamin A, most drug supplies are not sufficient to meet demand. Therefore, min/max inventory control strategies are difficult to implement, and drug logistics managers cannot avoid stockouts for many of the products they manage. Instead, the managers are forced to rely on rationing strategies to distribute the scarce supply equitably and ensure that stockouts of drugs used in life-threatening cases are minimized.

Rationing strategies include prorating quantities to distribute based on population and access, identifying certain drugs for which full supply is attempted, or distributing drugs in kits intended to last a certain period of time. Thus, for reasons that do not reflect badly on drug logistics managers, their logistics systems are seldom as effective or as efficient as the contraceptive logistics systems with which they coexist.

Use

Product use covers such activities as prescribing, dispensing, and client consumption. Use is conditioned by such factors as packaging, labeling, prescribing and dispensing behavior of service providers, and customer attitudes. Although ensuring rational product use is the logical final step in the logistics cycle, it is the responsibility of service delivery staff rather than logistics staff. The job for logistics staff is to ensure that the products and dispensing materials, such as envelopes, bottles, and labels, are available at SDPs for care providers, and to make sure that consumption rates are reported or measured in some way. (Product use is not a variable for analysis for this study. This topic is covered extensively by such organizations as the World Health Organization [WHO] programs for Drugs and Essential Medicines and the International Network for Rational Use of Drugs.)

Human Resources

Human resources refers to the number of staff and their skills from the top to the bottom of the logistics system. Historically, the health sector has not regarded logistics as an important activity. The result is that logistics staff are often not trained or supervised to carry out their allotted tasks, especially for product selection, forecasting, procurement, LMIS, good storekeeping, stock accounting, and transport. Yet none of these tasks is beyond the capacities of managers and staff in developing countries. When, as has often been the case for contraceptive logistics, personnel are given good work routines, equipment, and training, the results are correspondingly good.

3. Health Sector Reform

Provision of public health services in developing countries has evolved through at least three phases in the past 30 years. In the 1970s, the emphasis was on vertical programs such as family planning, mother and child health, malaria, immunization, tuberculosis, and leprosy. A major development toward the end of the decade was the designation of primary health care (PHC) as the overarching principle for future program development.

Thus, over the following decade, selective approaches to PHC were developed, with child survival emerging as an important theme. Examples of child survival efforts are universal child immunization (UCI), growth monitoring, control of diarrheal diseases, and exclusive breastfeeding. Developing and strengthening the systems required to support PHC also began receiving attention, including systems for health worker training, information management, social marketing, and logistics.

Health sector reform emerged as a major focus in the 1990s. Although its antecedents go back many decades, the symbolic origin of this trend is the *World Development Report 1993: Investing in Health* (World Bank 1994). Contributing factors include the changes that have taken place over the last decade in health needs, political environments, economic conditions, the roles of the public and private sectors, technologies, and donor policies. Put more concretely, increasing burdens of disease, especially infectious and immunization-preventable disease, have combined with population growth, weak economies, and donor biases toward achieving financial sustainability to induce reforms intended to stretch limited resources further. Although many of the programs and approaches developed in the past remain relevant, HSR proponents now seek to create environments in which health services can be delivered more rationally.

Characteristics

HSR is not homogenous in content between countries or even within a single country over time, and definitions of HSR vary. *Investing in Health* is the best-known source for defining HSR goals. Two other good sources of information on HSR are *Health Sector Reform in Asia and the Pacific*: *Options for Developing Countries*, published by the Asian Development Bank (ADB 1999) and *Health Sector Reform in Developing Countries: Making Health Development Sustainable*, edited by Peter Berman (1995). From these and other publications emerges a list of the HSR characteristics most relevant to our analysis:

- At its most basic level, HSR seeks strategic and fundamental change throughout national health systems for the purpose of improving the quality, equity, access, and financial sustainability of health services.
- To rationalize allocation of scarce resources to health services, HSR relies primarily on the development of an essential services package (ESP) based on cost-effectiveness analyses. The typical ESP covers family planning, prenatal and delivery care, management of the sick child, treatment of tuberculosis, and case management of sexually transmitted diseases. The goal is to divert public funds from expensive tertiary care and redirect them to primary health care.
- To promote maximum ESP coverage, HSR programs may also include the following innovations in management and financing:
    - Separation of financing and services delivery through restructuring of these responsibilities.
    - Integration of health services and support services.

  - Decentralization of planning and budgetary decision making.
  - Implementation of cost-recovery measures.
  - Privatization of selected operations.

- Improving service at districts and SDPs is usually an HSR priority. These improvements require adequate resources, including trained personnel, good facilities, medical equipment, transport, and expendable supplies (contraceptives, drugs, vaccines, medical and diagnostic supplies). It follows that an important objective of reform programs is to facilitate efficient allocation of all these resources to local levels.

- HSR programs, as noted, vary from country to country in the range of innovations they introduce and their timeframes for implementation. An effort to transform national health systems radically, introducing financial restructuring and the other innovations in one comprehensive and coordinated effort, is sometimes called "big R" reform. Programs that seek more gradual change and favor incremental implementation of one or two innovations over time are sometimes referred to as "small r" reforms (Bossert 2000). Among low-income countries, only Zambia is considered to fall into the big-R category.

HSR and Logistics Management

The HSR innovations most likely to affect public-sector logistics systems are integration, decentralization, cost recovery, and privatization. These reforms are so widespread that they represent global trends (FPLM 2000a). All four innovations have the potential to improve logistics services. They may also cause problems that, in turn, could cause logistics operations to deteriorate. The interplay between these innovations and logistics operations is complicated and at times so subtle that it is not easy to attribute causality for many of the developments taking place within the context of HSR. Specific examples of this problem are discussed in section 4.

Integration

National vertical family planning programs are credited with most of the increases in CPR since the 1960s. Nevertheless, starting in the mid-1990s, the long-standing debate over integrated versus vertical programs has favored integrated services delivery. Indeed, participants at the 1994 Cairo International Conference on Population and Development endorsed the trend toward an integrated reproductive health strategy that combines preventive and curative services and promotes and maintains reproductive health throughout life (ICPD 1994).

Integrated services delivery, in turn, has led to integrated logistics systems in some countries. Intuitively, the concept of integrated logistics is appealing, but in practice it is exceedingly complex and difficult to implement effectively. This comes about, in part, because integration is a general management philosophy that, once accepted, can influence all health sector operations. Another reason may be that the HSR rationale (i.e., improvements in efficiency and quality) applied to delivering integrated services through an ESP applies equally well to logistics systems. A key argument advanced by supporters of integration is that vertical logistics systems, heavily subsidized by donors, are not financially sustainable without such donor support (FPLM 2000a). Overall, the hope is that combining product selection, procurement, and distribution operations for contraceptives, essential drugs for PHC, program-specific drugs, and vaccines will reduce duplication and provide better service at lower costs.

Although in principle, the concept of an integrated logistics system is intuitively appealing, in practice it is exceedingly complex and difficult to implement successfully, because it deals with more products, funding sources and purchase methods. It is more difficult to coordinate needs forecasting and quantification of purchases for several groups of products rather than just one group. Another difficulty lies in managing the different preconditions, schedules, and procedures that multiple funding sources require. The insistence of some donors on special tracking and accounting procedures for their products is still another source of difficulty.

Decentralization

Decentralization, which pushes responsibility for health services management to intermediate and, particularly, to district levels, is one of the most widespread and visible HSR innovations (Cassels 1995). The rationale here is that once resources are allocated, local managers can manage them more effectively and efficiently than can distant central-level officials.

Paradoxically, the trend in modern logistics management is to increase efficiency by consolidating management of LMIS, procurement, and distribution at higher levels—the exact opposite of decentralization. A major concern is that staff at district health offices, where human resources are invariably insufficient, cannot take on the added logistics responsibilities that decentralization brings. These are tasks that can be performed satisfactorily only by qualified personnel who receive effective training and supervision.

Decentralization is sometimes accompanied by "basket funding" arrangements that pool all financial inputs and allot the monies to districts according to formulas based on population, access, economic status, and health status data. These arrangements resemble block grants that district health teams manage directly in accordance with agreed-upon guidelines. Potential problems arise with such arrangements when local management of funds includes procurement of contraceptives and drugs. For example, if the cost of contraceptives counts against the grant, a local decision maker may order smaller quantities of contraceptives and reallocate the savings to drugs. Another potential problem that does not apply to donated contraceptives, but does apply to locally procured contraceptives and drugs, is that direct purchases from commercial suppliers by districts may result in high unit costs and weak quality assurance.

Cost Recovery

Cost recovery is the HSR initiative that seeks to contribute to financial sustainability of the public health system by obliging clients to pay for a portion of the goods and services they receive (e.g., consultations, diagnostic services, use of operating theaters, and expendable medical supplies, drugs, and contraceptives). Cost recovery seems to work best for curative services. However, the financial significance of cost recovery in general is debatable; some studies show that recovery rates from user fees are only about 5 percent of total recurrent government health expenditures (Berman 1995).

The cost recovery activity most closely associated with logistics operations is the revolving drug fund (RDF). The RDF concept is to sell drugs to clients and use the revenues to purchase more drugs. Although MOHs and donors have experimented with RDFs since the 1970s, there are few, if any, examples of financially successful RDFs operating on a significant scale in the public sector. However, there are a number of examples of successful small, moderate, or large RDFs run by nongovernmental organizations (NGO).

Within the last few years, it has become increasingly common to charge a nominal fee for family planning services. Sometimes the charge is for the family planning consultation, sometimes for the contraceptives themselves. Revenues are seldom applied to new product acquisition because donors provide virtually all contraceptives. On the other hand, these revenues can help pay for fuel, facility maintenance, and salary supplements to service providers.

Associated with this HSR innovation are a number of potentially troubling consequences. In times of increasing costs for program operations, an MOH may decide to increase financial sustainability by imposing or raising user fees. Experience has taught, however, that when fees are raised, contraceptive consumption often drops suddenly, and consumption may stay erratic for months, resulting in stock imbalances throughout the system. Accounting systems put in place to handle cash and financial data create additional responsibilities and require training for logistics and SDP staff who may already have problems keeping up with their current workload. Thus, cost recovery through user fees has the potential to affect product availability negatively.

Privatization

HSR also calls for increasing private-sector involvement in health service delivery. In contrast to decentralization, where HSR goals contradict state-of-the-art trends in logistics management, this push for privatization within the health sector is consistent with private sector trends in "outsourcing" many or all logistics functions, e.g. transport and storage. Privatization may take different forms:

- Giving a greater role to private or other nongovernment providers of health and family planning services or support services.
- Contracting out key functions to private-sector companies.
- Privatizing some operations entirely.

Any of these developments may have implications for logistics systems.

The expanding role of NGOs in primary and reproductive health care is likely to increase greatly the quantity of contraceptives they distribute. As availability increases, so will the volume flowing through MOH distribution systems. Increased distribution through NGOs will require significant modifications in LMIS and forecasting practices.

Contracting out specific functions, such as port clearance, warehousing, and transport, has great potential for improving services and decreasing costs. Key constraints are the inexperience of public-sector logistics managers in supervising contract compliance and the notorious inefficiency of ministries in paying their bills. These factors can conspire to produce undesirable outcomes, such as engagement of unqualified contractors when qualified ones are available; lack of early detection of nonperforming contractors; and unwillingness of some contractors to bid for contracts for fear they will not be paid on time or not paid at all.

Privatization in its most extreme sense—the selling of state-owned assets to private owners—is an unusual occurrence in developing country health sectors outside the former Soviet Union. What is taking place is the conversion of state-run organizations, such as central medical stores, into semiautonomous organizations intended to run along commercial lines. Such a quasi-private enterprise, usually governed by a board of directors that includes representatives from the ministries of health and finance, is, in principle, insulated from political pressure. However, if the new operation does not perform as intended,

considerable time and money will have been spent to create a new organization that is no more efficient than the old one.

4. Findings

Comparison of indicator results for the nine dependent variables of analysis permitted the study team to make a number of general findings across countries. The variables fall into two groups:

- Four variables are vital; that is, they must be managed effectively for contraceptive logistics operations to take place at all. Variables in the vital group are product availability at SDPs, financing, purchasing, and LMIS.
- Five variables are important; that is, contraceptive logistics systems can operate even when some of them are performed suboptimally. However, they must be performed well for systems to operate efficiently. Variables in the important group are product selection, forecasting, storage and inventory management, transport, and human resources.

Status of Variables

Appendix I shows that the indicator results are relatively consistent across the country sample. Of 40 indicators for 9 variables, 38 could be tabulated. Of the 38 tabulated indicators, 30 had the same results for at least 3 or 4 countries in the 4-country sample. For 6 indicators, the results were split 2 and 2; and for 2 indicators, data were not complete enough to give results for all four countries.

For vital variables over defined periods of HSR, the results for contraceptive logistics are as follows:

- **Product availability** at SDPs for modern methods has improved in all four countries (appendix J). The CPR also increased in all four countries.
- **Financing** has been adequate, and **purchasing** has been performed effectively. However, these two functions are handled entirely by donors, so there is no sustainability for these functions.
- HSR has affected **LMIS** negatively only in Zambia, but family planning program staff in Ghana and Tanzania have made explicit efforts to protect the integrity of their information systems when urged to merge them with the essential drugs system. In Kenya, the question of integrating LMIS has not come up. Negative experience with HSR and contraceptive LMIS in other countries suggests that LMIS is vulnerable unless special care is taken to protect this system.

For important variables, the results are as follows:

- Change in performance of **product selection** is mixed, but mostly positive. All four countries have rationalized their contraceptive method mixes since HSR began. In Zambia and Ghana, the contraceptives in highest demand are on the EDLs; in Tanzania and Kenya they are not.
- **Forecasting** is generally performed well in Ghana, Tanzania, and Kenya, where an LMIS is working. In Zambia, staff have adequate forecasting skills, but they lack a functioning LMIS and must perform needs forecasting with inadequate information.
- **Storage and inventory management** is generally performed well at central levels and generally not performed well at district and SDP levels in Zambia, Ghana, and Tanzania. Kenya is the exception; here, central and district levels perform well.

- **Transport** is generally adequate between central, district, and SDP levels in Zambia, Tanzania, and Kenya. In Ghana, performance is inconsistent, and lower-level managers must rely on their own initiative to improvise transport arrangements.

- **Human resources** development activities have not produced good results at district and SDP levels in Zambia, Ghana, and Tanzania. Specific logistics tasks are not handled well, and supervisors appear to ignore logistics when visiting SDPs. Kenya is a partial exception; training and supervision have produced good results at the district level but, again, data are not available for SDPs.

Influence of Health Sector Reform on Logistics

Understanding how HSR is affecting contraceptive logistics is the basic purpose of this study. It is important, however, to be cautious when attributing specific findings to HSR for the following reasons:

- Although indicators may suggest change over time, in most cases, they do not prove it. They are measures of logistics system performance taken at one point in the midst of incremental or intensive HSR programs. In most cases, the study team did not find corresponding measures in place before HSR began, although data on product availability at SDPs was a fortunate exception.

- Even when the study team could make direct associations between specific findings and known HSR program activities, the results were not necessarily uniquely attributable to HSR. For example, logistics training for district and SDP staff in the study sample, carried out as part of defined HSR programs, mostly has produced poor results. However, many of the same logistics training activities carried out in countries with no HSR program have shown equally poor results.

- There may be more than one possible cause for observed developments. During the incremental period, an HSR program is limited to one or two innovations, frequently decentralization or cost recovery. Once the intensive program is launched, HSR tends to become much more complex. Additional innovations can include restructuring that separates financing and services delivery; providing essential services packages; integrating health services delivery; and integrating such support systems as care-provider training or logistics. In such cases, where multiple structural changes are occurring within the health sector, it is difficult to attribute the relative impact of each innovation on logistics.

- Implementation of the intensive HSR programs tends to dominate the public health sector to such an extent that many stakeholders and observers attribute *any* development that takes place to HSR. For example, in Zambia, Ghana, and Tanzania, product availability at SDPs improved during intensive HSR programs under which changes were being made in logistics systems. But, sustained bilateral donor financing for contraceptive supplies and vertical logistics system development is arguably a better explanation for the trend toward improved product availability than changes resulting from HSR.

Thus, caution is essential for relating study findings to HSR. In several instances, valid conclusions do not emerge directly from a review of tabulated indicators. To interpret their significance, it is necessary to first understand the history and context of developments in specific countries.

Caveats notwithstanding, it is apparent that specific HSR innovations have influenced the operations of both contraceptive and drug logistics systems**,** sometimes positively and sometimes negatively. Although the most visible innovation is integration, other HSR activities such as decentralization, cost recovery, and privatization have also had important effects.

Integration

The underlying purpose of integration, either for health services delivery or logistics support, is to achieve more efficient allocation of resources by merging operations and eliminating duplication of functions. In principal, integration of logistics operations can be carried out for all logistics functions. In the four sample countries, the functions most affected to date are LMIS, storage, and transport.

LMIS

In two of the sample countries, integration affected LMIS through implementation of a national HMIS. In Zambia, planners had assumed that HMIS stock availability data for a few tracer drugs would be sufficient for all logistics management purposes. Decision makers thereupon informed district staff that they no longer needed to submit monthly activity reports for family planning and other vertical programs. Unfortunately, the LMIS activity reports had contained information that the HMIS did not provide—that is, data on consumption and stock positions. Therefore, central-level logistics staff lost access to the information they needed to monitor stock positions and prepare forecasts.

In Tanzania, the family planning program successfully lobbied to preserve its LMIS separate from the HMIS, and this LMIS continues to work well. The vaccine program was not as successful because logistics data at lower levels had appeared on the same form as service statistics. With the implementation of the HMIS, this form was discontinued, compromising the quality of vaccine logistics information and preventing information regarding vital products from reaching central-level program managers. Some blame this development for subsequent forecasting and purchasing problems.

In Ghana and Kenya, the question of integrating contraceptive LMIS with LMIS for other products has not come up explicitly, and their systems continue to work well. Neither of these countries has a drug LMIS. There are a variety of reasons for this situation, but the principal one stems from the lack of sufficient drug supply. Because rationing predominates, forecasting and inventory control have not been drug management priorities. This may explain, in part, why HSR planners do not yet appreciate the contributions of LMIS toward ensuring a constant flow of full-supply products, such as contraceptives and vaccines, under the pre-existing vertical systems.

Integration of LMIS is a function for which meaningful findings do not emerge directly from indicator trends. On their face, the indicators suggest that integration is not a problem. However, a review of contextual information makes vulnerability of LMIS to HSR innovations evident.

Storage and Inventory Management

In Zambia, Ghana, and Tanzania, MOHs have placed most expendable supplies used by different service delivery programs under one roof (or on one campus) at central medical stores. In all three countries, the quality of stores management appeared to be very good, a concrete example of a positive result associated with HSR.

Before MOH took this step in Zambia, there were separate storage sites in the capital city for as many as eight different programs. Correspondingly, there were a variety of transport arrangements from the central to the district level, not all of them reliable. Decision makers at both levels had difficulty ensuring that districts received their complete complements of supplies. Few would dispute that the new arrangement is easier to manage.

Ghana and Tanzania have seen similar results, but in Ghana integrated central storage is less evolved. The vertical programs keep their stock in separate bays at one storage complex located 22 miles outside the

capital city of Accra. The convenience of one-stop shopping is constrained by the requirement that district-level managers must first obtain signatures from separate program offices in Accra before they can collect their supplies.

Kenya's MOH stores and distributes essential drugs and other supplies through its central medical store, the Medical Supplies Coordinating Unit (MSCU). This facility is known for its poor stores management and transport. The MOH hopes to improve this operation and has been receiving technical assistance from contraceptive logistics system staff to assess problems and propose solutions. Due in part to such assistance, the MOH is now in the early stages of reconstituting the warehouse as an autonomous enterprise managed along commercial lines. The plan is to integrate the contraceptive logistics system with this new enterprise once it operates well enough to guarantee good service. This approach is similar to the one adopted in Tanzania. Thus, Kenya seems to be the contrarian case, the one in which the exemplary performance of a vertical contraceptive logistics system has influenced a ministry to improve and integrate logistics services through its HSR program.

It is interesting to note that none of the four sample countries has been able to project integrated storage or good quality stores management to the district and SDP levels. This situation demonstrates how much more difficult it is to induce change in scores of districts and hundreds of SDPs than in ten service programs and one central warehouse. In view of the relatively modest quantities of stock handled at districts and SDPs, however, no great harm to contraceptive availability seems to have come about from delaying stores integration at these levels. What is lost, however, is the efficiency associated with placing all stock in one place under the control of one trained staff member.

Transport

Integration has tended to simplify transport arrangements in most of the countries we studied. In Zambia and Tanzania, HSR has improved management of truck fleets attached to central medical stores, and all districts have at least two operating vehicles. We do not know if this number represents a change from pre-HSR periods, but it is apparent that in both countries, the HSR programs have allocated resources usefully to district-level transport.

Interviews with district and SDP staff in Zambia and Tanzania confirmed that deliveries from the districts to the SDPs usually take place more or less on schedule. Nevertheless, inadequacy of transport was a frequent complaint. It should be noted, however, that transport is required for other activities besides logistics, including transporting patients. In some cases, when deliveries were on schedule, respondents still blamed the transport system if all the requested supplies did not arrive, even though the real problem was that requested supplies were out of stock at higher levels.

Transport in Ghana does not work as well as in Zambia and Tanzania. The central medical store and regional warehouses in Ghana issue stock strictly on a cash-and-carry basis, and clients must either provide their own transport or purchase expensive private services to transport supplies from the rural medical store to their clinics. Another negative consequence affects drug logistics; namely, lower-level sites are more likely to buy supplies from the commercial sector at higher unit costs because these suppliers do not charge extra for delivery.

The situation in Kenya is different from the other three countries in the study. Kenya's incremental HSR program has not yet integrated logistics services. The current vertical contraceptive logistics system is particularly well-managed, with good central storage and transport coordinated by a computer program for distribution resource planning (DRP). This system has worked so well that donors wishing to ensure delivery of sexually transmitted infection (STI) drug kits have contracted with the contraceptive logistics system to manage their distribution. It is as if good service spontaneously induced integration.

Decision makers in Zambia, Ghana, and Kenya have decided not to include vaccines in their integration plans. Tanzania, however, has integrated storage and transport of vaccines almost completely at all levels.

Decentralization

HSR planners hope to improve equity, access, and efficiency by granting planning and budgetary decision making to district health management teams (DHMT). Zambia and Ghana have implemented decentralization, Tanzania is just beginning the process, and Kenya is planning to do so eventually.

Financing

For decentralization to succeed, the resources provided to the district health teams must be sufficient for carrying out the locally developed work plans. Because donors have been willing to finance contraceptive supplies that meet demand, stockouts at district and subdistrict levels are unusual and almost always are attributable to lapses in inventory management, not to insufficient financing. The same is generally true of vaccines. Drug financing in Zambia and Ghana is insufficient, but the issues in the two countries are very different.

In Zambia, most drug financing comes from donors and development banks (66%), and a lesser share comes from the government. Drug allocations to districts originate with three sources. One is a central population-based grant for buying drugs from the central medical store in which no money changes hands; the purchases are debited against each district's account. The second source comprises drug kits for SDPs and community-based workers. The third and least important source is the district operating budget.

Neither the Zambian government nor the donors have provided as much funding as anticipated, and it has been difficult for the MOH to meet the conditions for competitive procurement required for spending development bank funds. Consequently, the per capita value of drugs allocated to districts fell dramatically during the intensive HSR period. In three districts for which complete data are available, the average value of *drug allocations* per capita fell from U.S.$1.14 in 1995 to U.S.$0.73 in 1999. The study team crosschecked the values of *drugs actually shipped* with the value of *drugs allocated* from the central warehouse for three districts in 1999. Whereas the allocations indicated an average value of U.S.$0.73 per capita, the value of products shipped was much lower, ranging from U.S.$0.24 to U.S.$0.36 per capita. To interpret these numbers, consider that WHO suggests that at least U.S.$1 per capita would be required for PHC, and that would be adequate only if allocated rationally.

The unpleasant result is that drugs of all types are chronically out of stock at districts and SDPs in Zambia. Surveys show that consumers regard availability of drugs at SDPs as a primary indicator of quality of service. Even though contraceptive availability has improved since the beginning of HSR, drug supply has deteriorated. Therefore, district and SDP staff and the clients might all be forgiven for concluding that logistics services have deteriorated under HSR, and that, for drugs at least, decentralization has not improved the allocation and management of resources. However, the problem originates in the financing function of drug logistics and does not represent an inherent flaw in decentralization.

In contrast to Zambia, Ghana's public health system does not suffer from widespread stockouts of drugs at district and SDP levels. However, reforms carried out under HSR have not led to sustainable drug financing. Drugs are supposed to be financed fully by cost recovery through the cash-and-carry and exemption programs. The MOH has no line item in its budget for drug purchases. Under the cash-and-carry program, each level—the central medical store, regional medical stores (RMS), district medical

stores (DMS), and SDPs—purchases drugs from the level above and charges a predetermined mark-up. The revenues are maintained in a revolving fund and used exclusively for drug resupply.

Ghana's intention to recover 100 percent of drug costs has not been realized. Since its implementation, the revolving fund has been recapitalized twice (1990 and 1996) through World Bank credits. If current trends at the CMS continue, another infusion of capital will be needed soon. The following factors have contributed to decapitalizing the revolving fund:

- As public health entities, the CMS and RMSs cannot refuse to provide drugs to lower levels when they do not have cash. Thus, "credit and carry" in place of "cash and carry" has become the reality in many places. The RMSs are deeply in debt to the CMS, and the DMSs are in debt to the RMSs.
- The growing value of drug payment exemptions for selected groups means that dispensing facilities must wait for reimbursements, thus diminishing funds available for stock replenishment. Lengthy delays and low average reimbursements to dispensing facilities (only 73%) further erode capital bases at operational levels.
- Decentralization has allowed a growing proportion (more than 60%) of drugs sold at health facilities to be purchased from private vendors rather than the CMS or RMS. District staff cite stockouts at the CMS or RMS, convenience (private vendors deliver), and lower prices as factors for purchasing on the open market.

Although the cash-and-carry program has not led to long-term financial sustainability for drug financing, Ghana has achieved its goal of increasing drug availability at the lower levels. A recent study using a different methodology, showed improved drug availability at public health facilities after the intensive reform period, with 83 percent availability of 30 tracer drugs in 1998, up from 60 percent availability of 21 tracer drugs in 1993 (Rankin et al. 1993; Ministry of Health Ghana 1999a).

Ghanaian service providers attributed the increased drug availability to implementation of the cash-and-carry program. They also noted that consistent drug availability enhanced client attendance at health centers and probably increased the use of family planning services. Thus, Ghana's approach has been successful in that it has enhanced the quality of services without compromising on equity—two preferred outcomes of HSR.

Human Resources

An unstated assumption about decentralization is that it permits sufficient numbers of district staff to be trained to carry out the new responsibilities that local decision making requires. Although it was beyond the scope of this study to determine whether the numbers of staff in the post were sufficient, we did find that where logistics is concerned, training interventions carried out as part of HSR programs in both Zambia and Ghana did not provide district or SDP staff with the skills or motivation to execute logistics responsibilities well.

In Zambia, capacity building for all aspects of public health management was a visible and popular part of the intensive HSR program. DHMT staff frequently stated that they welcomed the decision-making authority that accompanied decentralization and appreciated the value of training in helping them carry out their new responsibilities. SDP staff were less vocally supportive, but they were not negative.

The skills required for contraceptive, drug, and vaccine logistics at districts include product selection, order quantification, LMIS reporting, inventory management, storekeeping, and supervision. At SDPs, the list of required skills is shorter, covering only inventory management, LMIS reporting, and storekeeping. Central MOH staff developed manuals and training courses to teach these skills to districts and SDPs.

They provided stores management training for districts; district staff, in turn, trained SDP staff. Our results show that staff at almost all SDP sites reported that they had been trained in almost all the basic skills. Because of a moratorium on training imposed by a new minister of health in April 1998, central staff were unable to train in product selection and quantification as planned. However, they were able to present short orientations on these topics to SDP staff at district meetings held for other purposes.

Using checklists developed from the manuals, the study team evaluated the results of these logistics performance improvement activities at districts and SDPs. The results were disappointing: few of the tasks were carried out as intended. District and SDP staff had somehow come to believe that it was necessary to apply the procedures listed in the manuals only for drugs, and not for contraceptives. At all district offices, staff could describe the consumption-based process for quantifying needs and stated that they applied it in practice. They were unable to provide substantiating documentation, however.

One positive result for human resources in Zambia was that district staff appear to have made quarterly supervisory visits to SDPs as intended under decentralization. However, the poor results for executing logistics tasks suggest that the supervision did not cover logistics. Central and regional staff stated that they did not have the transport or per diem required for supervising lower levels.

In Ghana, capacity building was also a significant component of the intensive HSR period. Decentralization was to allow districts to identify local training needs and to plan and budget accordingly. Although the number of training activities had increased at districts and SDPs, there was significant regional variation in training content; contraceptive logistics was included in fewer than half of the ten regional training plans in 1998 (Ministry of Health Ghana 1999a). Furthermore, the quality of the contraceptive logistics training was questionable and did not appear to be competency based. Although one person at each facility in the sample had received contraceptive logistics training, no facility had a procedures manual for inventory management, LMIS reporting, or storekeeping. Neither district nor SDP staff carried out logistics tasks effectively for these functions.

As in Zambia, in Ghana district staff began to supervise SDPs more frequently. Benefit to contraceptive logistics of this increased monitoring, however, has not been fully achieved. Supervision occurs by rotating district (and sometimes regional) staff to the SDPs. Not all the staff are qualified to oversee contraceptive logistics. The lack of skilled staff, combined with poor execution of logistics tasks, suggests that neither training nor supervision support SDP staff adequately in contraceptive logistics. Despite poor results, both district and SDP staff stated that frequency of in-service training had increased significantly after HSR and has enhanced staff motivation and commitment.

It would be unfair to attribute poor training and supervision results uniquely to HSR or decentralization. Poor quality training occurs equally in non-HSR environments. It remains the case, however, that HSR-related efforts to improve staff logistics performance in Zambia and Ghana simply did not work.

Cost Recovery

Cost recovery for health services has taken several forms, some directly related to contraceptive logistics. In Zambia, SDPs charge fees for consultations but dispense free contraceptives and drugs. A few districts have experimented with insurance schemes. In Ghana, clients are charged fees for outpatient services, but they must purchase drugs and contraceptives. In Tanzania, only hospitals charge consultation fees for services and recover partial costs for drugs; health centers and dispensaries provide free services, drugs, and contraceptives. In Kenya, SDPs charge for a range of services (consultations, diagnostics tests, and use of operating theaters). Patients are not obliged to pay the consultation fees if they do not receive any drugs. Kenya has also begun to experiment with facility-based revolving drug funds.

For the study sample, cost recovery directly affects contraceptive logistics only in Ghana and Tanzania. In Ghana, cost recovery for contraceptives consists of fees for commodities; the fees are used to enhance the quality of services, not to repurchase supplies. At the SDP level, 50 percent of the costs recovered from contraceptive sales are retained. Another 20 percent is divided equally between the district, and regional levels. The remaining 30 percent goes to the central level. Since the family planning programs' operational costs must be largely self-supporting, use of revenue to enhance performance of the program is largely at the discretion of family planning staff. Given the scarcity of transportation resources at SDPs, contraceptive revenues are often used to cover transport costs. The revenue is also used to procure expendable medical supplies (cotton wool, gloves, etc.) and for supervisory visits, local training, and per diems. The revenues are modest, but they allow family planning staff to improve the contraceptive logistics functions of transport and human resources.

Tanzania does not charge user fees and imposes no cost recovery charges for contraceptives and drugs distributed at health centers and dispensaries. The capitalization system set up under HSR allows hospitals to establish revolving funds to purchase drugs. The original intention was for hospitals to mark up drugs by 12.5 percent to allow full cost recovery and cover transportation costs. Due to political pressure, drugs are actually sold at 50 percent of cost (or exempted), and the MOH maintains the fund by providing credits for each district in an account at the Medical Stores Department (MSD). (As in Ghana, a semiautonomous entity has replaced MOH's old central medical store.) Hospitals use the revenue generated by drug sales to purchase drugs from the open market or to cover transportation costs for collecting supplies from the MSD.

Another form of cost recovery in Tanzania is the MSD per-cubic-meter fee for storage and distribution costs for drugs, contraceptives, and vaccines. The MOH covers the drug logistics costs, the U.S. Agency for International Development (USAID) and the United Nations Population Fund (UNFPA) cover contraceptive costs, and the Danish International Development Agency (DANIDA) covers vaccine costs. Contraceptive logistics has benefited significantly because MSD costs are 52 percent of the value of the vertical program costs for the same storage and distribution functions.

Privatization

In Zambia, Ghana, and Tanzania, privatization has affected logistics for contraceptives and other products. In Kenya, privatization has not yet affected logistics strongly, but probably will in the future, and measures to privatize portions of health service delivery are taking place already.

Privatization has produced good results for central storage and distribution in Zambia and Tanzania. The two countries, however, chose different approaches. In Zambia, the MOH engaged a private contractor to manage the central medical store (Medical Stores, Ltd., or MSL) and provide transport services to the districts. The MOH Procurement Unit purchases new stock. The contractor has improved MSL's storage facility and security and provided a new truck fleet. For contraceptive logistics, with its generous donor financing, this development has been beneficial.

For drug logistics, however, these new arrangements do not solve Zambia's biggest problem, which is financing. The circumstances under which one important donor recently withdrew funding for PHC drug kits is relevant to privatization in Zambia. This stakeholder felt that the MOH awarded the MSL management contract through a nontransparent process, and that the contract was not financially advantageous to the ministry. The study team does not know whether the donor's version of events is true, but the perception of nontransparency is important. Another stakeholder, a development bank, had similar perceptions when the MOH failed to meet competitive procurement requirements for spending credits to purchase drugs. In Zambia, the MOH is inexperienced in managing contractual arrangements with the private sector according to international standards. Its inexperience has negatively affected drug

financing and, ultimately, the quality of service in SDPs. Although problems of this sort are not unique to HSR, it remains true that HSR planners and implementers could not prevent them from occurring in Zambia, even though improving financial management at MOH was an important HSR objective.

In Tanzania, the approach to privatization was to convert the CMS into the autonomously managed MSD. To date, investments in developing capacity at MSD appear to have increased efficiency and effectiveness. Procurement is relatively free of political pressures, and MSD routinely manages international competitive procurement processes. To ensure its viability, MSD charges by cubic meter for all services, and the study team found storage and distribution of commodities to district levels to be performed adequately. Logistics managers at the MOH do not have experience in supervising such an autonomous organization, however, and a monitoring system to assess MSD performance against contractual obligations is being developed.

Although contraceptive and drug managers in Tanzania are convinced of the benefits of integration and MSD management, vaccine managers are not. They perceive MSD as ineffective in quantifying needs for the vaccines it procures, and they attribute nationwide shortages to MSD. The problem seems to originate in the fact that good quality forecasting data are no longer available since implementation of HMIS. Overall, however, the Tanzanian model of privatizing central-level storage and distribution appears to have improved contraceptive logistics by providing good quality storage and transport at lower cost.

In Ghana, the only element of privatization is the inadvertent, but increasing, reliance by district levels on private vendors for drug purchases. These purchases do not directly affect contraceptive logistics, but they do affect the overall quality of services at SDPs, including reproductive health services. There is room to question the value of this particular form of privatization. If districts obtain consistently good quality drugs at low unit costs and do not accumulate debt to the commercial sector, these purchases may allow optimal use of financial resources and ensure widespread drug availability. However, if the districts rely on private-sector purchases because of credit and convenience of delivery, but pay higher drug prices for these benefits, privatization is likely to have a negative effect on drug logistics by further eroding sustainability of drug financing. Also, if districts purchase drugs from private vendors, the central level may have difficulty monitoring adherence to the EDL for all purchases.

Influence of Other Factors on Logistics

Other influences have affected the status of the variables in this study, in particular, donor financing and the persistence of vertical program management.

Donor Financing

One of our important findings concerns the increases in both contraceptive availability and CPR in all four countries during HSR. This finding begs the question of whether these trends should be attributed to HSR. Certainly, study results show that some HSR-sponsored activities have benefited both contraceptive and drug logistics. But the results also show that donors played key roles in financing both contraceptive procurement and contraceptive logistics system development. In all four countries, these activities have focused on the very logistics functions that make up the variables for analysis.

In Zambia, the British Department for International Development (DFID) has been the main financier of both contraceptives and contraceptive logistics system development, with USAID playing a supplemental role for both inputs. Other funders of contraceptives for Zambia include the Swedish International Development Agency (SIDA), the Netherlands Development Assistance Agency (DGIS), and the International Planned Parenthood Federation (IPPF). In Ghana, USAID and DFID are both important

suppliers of contraceptives, with USAID taking the lead in system development. UNFPA and the Japan International Cooperation Agency also fund contraceptives for Ghana. In Tanzania, USAID and UNFPA are the leading suppliers of contraceptives, and USAID takes the lead in system development. DFID and IPPF also fund contraceptives. In Kenya, DFID, Kreditanstalt für Wiederaufbau (KfW), a German assistance agency, SIDA, and the World Bank fund contraceptives, while USAID has invested extensively in developing the logistics system. To illustrate the magnitude of these inputs, appendix K summarizes donor contributions for 1998 in the four study countries.

In all four countries, donor inputs have continued throughout much of the defined HSR periods. Although our study has not been designed to demonstrate causality, the study team believes that the most important single explanation for improvements in product availability is the continuity of donor support for contraceptive procurement and contraceptive logistics system development.

Persistence of Vertical Management

For the most part, vertical management has persisted in all four countries. This has been most true in Kenya, where the incremental HSR program has not yet directly affected contraceptive logistics. Indeed, the study team found that the good performance of the vertical contraceptive logistics system has stimulated an awareness in Kenya's health ministry that its essential drugs logistics systems can and should be reformed.

The experience in Tanzania shows that the persistence of vertical logistics management and HSR objectives for logistics integration can be compatible and even desirable. Before HSR reform came to the country, the central medical store was a poorly run operation, causing sponsors of vertical programs to set up their own logistics systems. Work to create the new MSD and upgrade operations began in 1994. By 1997, the MSD had demonstrated its competence and was able to convince the main contraceptive financier, USAID, that it could distribute contraceptives at a lower cost than the vertical system.

Consequently, the stakeholders decided to integrate the contraceptive system within the MSD over a one-year period. This changeover has not been entirely problem free, but most in-country observers consider it successful. If the change had taken place before reform of the central medical store, it probably would not have been successful. The positive evolution of logistics integration in Tanzania is attributable to the decision to preserve the vertical contraceptive logistics system until it could be merged with another capable system.

Ghana's experience is also characterized by the strong persistence of a vertical contraceptive logistics system despite the clearly stated HSR goal of integrating services and support systems. Two major factors have allowed contraceptive logistics to remain vertical: funding for contraceptives has remained fully donor dependent, and the family health unit has made concerted efforts to prevent integration of central-level logistics management into the Stores, Supplies, and Drug Management (SSDM) division of the MOH.

HSR in Ghana has also included a strong focus on improving financing mechanisms and logistics management of essential drugs. Contraceptive logistics systems have largely been left alone during the reforms because contraceptives are still funded by donors who have done so consistently over the past five years, and because the system has functioned well in moving commodities to SDPs. Reform efforts have concentrated on improving the poor performance of the drug logistics system through reorganization of SSDM and significant technical assistance and capacity-building activities for SSDM staff in procurement and financial management.

A major threat to contraceptive logistics, however, has been the intent to integrate central-level logistics management for all commodities under SSDM. Given operational problems with drug logistics, and the lack of an LMIS for drugs, family planning managers have been resisting this move until SSDM staff demonstrate the capacity to manage the contraceptive logistics system—specifically, the vertical contraceptive LMIS. SSDM staff have not received such training, and the family health unit argues that unless the training occurs, the contraceptive LMIS will collapse, and all investments in establishing such a well-performing support system will be lost. As in Tanzania, Ghanaian family planning managers recognize that integration of contraceptive logistics will have positive outcomes only if the drugs logistics system is competent, as well.

The experience in Zambia is difficult to characterize. Prior to 1994, the Planned Parenthood Association, not the MOH, distributed contraceptives for Zambia's public health sector. The MOH took over this function in 1994, and, from that year until 1997, a vertical logistics system, managed by a Contraceptive Commodities Logistics Unit (CCLU) evolved in starts and stops. During this period there were a number of problems, including bureaucratic struggles over who would manage CCLU and budgetary crises that left transport idled for lack of fuel. Despite two attempts, CCLU was unable to implement an LMIS. As noted, implementation of the HMIS derailed the second attempt, so central staff have no direct knowledge of stock positions or issues from lower levels of the system.

In 1997, there was a reorganization of the MOH such that the ministry itself retained political and policy leadership and a Central Board of Health (CBOH) was set up to manage health services delivery and support operations, including logistics. At that point, CCLU staff were assigned to an overall logistics coordinating office called the Services Support Division (SSD). Shortly after, the MOH engaged a private contractor to manage the central warehouse and its transport fleet. At this point, the contraceptive logistics staff worked through the SSD to negotiate procurements through DFID and through the contractor managing the central warehouse for central storage and delivery.

Since CCLU's inception, the donor, DFID—not MOH or CBOH—paid the salaries of the central level contraceptive logistics staff. Even after CCLU was merged with SSD, DFID continued to pay salaries because CBOH refused to create contraceptive logistics positions. Only under pressure did CBOH agree in 1999 to engage contraceptive staff for one year.

Prior to its merger with the SSD, the contraceptive logistics system in Zambia never did evolve into an effective operation. In Zambia, integration meant merging an ineffective contraceptive logistics system with the somewhat confused SSD/central warehouse contractor arrangement. This coincided with a series of crises related to drug procurement.

Under these circumstances, what kept contraceptive logistics in business at all was DFID's willingness to pay the salaries of capable but beleaguered contraceptive logistics staff, in addition to providing the contraceptives. Paid by an outsider, these staff constituted the functional equivalent of vertical management within the newly integrated system. If this verticality had not persisted, the problems encountered would have been far more disruptive for contraceptive logistics than they were.

5. Conclusions and Recommendations

The findings support three conclusions. They provide the basis for 25 specific recommendations to help guide governments and donors on effective planning for logistics within the context of HSR.

Conclusions

1. Vertical contraceptive logistics systems are an effective means for improving service to clients by improving product availability.

Study findings validate the hypothesis that vertical contraceptive logistics systems are an effective means of improving contraceptive product availability. This is not meant to argue that their performance cannot be improved upon or that they should never be tampered with. Rather, this is to argue that

- they achieve their intended purpose of supporting quality care for family planning clients, and
- within the context of HSR, policymakers, planners, and program implementers should take care not to impede their operations when going forward with innovations such as integration or decentralization.

2. Health sector reform can be disruptive for certain logistics functions, but it can also have positive effects.

Study findings also validate the hypothesis that, in many cases, HSR has been disruptive for specific logistics functions. Significantly, however, it is also apparent that HSR is responsible for important improvements. Since the allocative and operational efficiencies that HSR seeks are worthwhile goals, the challenge for HSR's advocates is to develop approaches that maximize positive results for logistics and minimize negative consequences.

3. In order to assure good logistics system performance, it is important for host country staff to pay sufficient attention to the many details of logistics system design and implementation when planning and carrying out HSR.

Study findings suggest that host-country and donor staff have chosen ambitious objectives for logistics management, such as "integration" or "decentralization," but have not backed up these choices with systematic work on the many practical problems of system design and implementation. By more thoroughly considering the operational implications of each reform, HSR planners will be able to ensure that benefits associated with well-performing logistics systems will not be lost in the process of implementation.

One significant implication of increasing attention to detail in planning is that governments and donors will have to invest more time and resources in logistics within the context of HSR. In all four sample countries, the HSR programs included logistics reforms. However, in no case were results evenly satisfactory across logistics functions and levels of the system, suggesting that more time, effort, attention to detail, and money is required to bring about sustained improvement.

Examples of incomplete designs and implementation plans that would have benefited from increased operational level planning include:

- An erroneous assumption that the HMIS provided all the information required for logistics management and that the LMIS was no longer needed (Zambia, Tanzania);
- Logistics training initiatives in support of integration or decentralization that are poorly executed on a one-time basis with the assumption that they will provide staff with sufficient knowledge and skills required to maintain the reformed systems (Zambia, Ghana); and
- Implementation of supervision regimes that do not cover logistics (Zambia, Ghana, Tanzania).

Furthermore, as governments and donors pay more attention to the details of implementation, it is important that they consistently engage appropriate expertise in doing so. Planners do not always understand the complexity of logistics systems, which may be one reason for incompleteness of designs and implementation plans. Analysis of World Bank disbursements for health projects for the years 1989–1995 shows that only 45 percent of 56 projects included expertise in pharmaceutical management, where the term "pharmaceuticals" covers essential and nonessential drugs, contraceptives, and vaccines (Falkenberg and Tomson 2000).

An important objective for planning and implementing logistics reforms is to assure that well-functioning vertical systems are not merged into newly designed integrated systems until the new systems have demonstrated competence and robustness. If this is not done, the result will be to compromise contraceptive availability without achieving gains for other product categories.

A second objective is to plan for "contraceptive security," which is analogous to food security or vaccine security. Security of contraceptive supply is a growing concern as governments and donors grapple with the problems of rising need for contraceptives and constrained resources for providing these commodities. Contraceptive security may be said to exist when national family planning programs:

- Are able to estimate their requirements accurately,
- Have or coordinate financing sufficient to meet projected for five to ten years into the future,
- Have the capacity to procure or engage others to procure required quantities of products on a routine basis, and
- Are able to move supplies to clients effectively (FPLM 2000a).

In three of the four sample countries, MOH staff are able to estimate their contraceptive requirements accurately. However, contraceptive financing and purchases are 100 percent donor-dependent in all of the countries, and only in Kenya is there systematic coordination for medium-term financing. None of the sample countries is even close to contraceptive security, and none has coherent plans for achieving it. Study findings show that, although HSR programs include logistics improvements on their agendas, planners and implementers give little thought to the important issue of guaranteeing future supply.

Recommendations

The detailed recommendations that follow are aimed at helping governments and donors more effectively plan and implement logistics reforms. Success in this endeavor will contribute significantly to HSR's stated goals of improving quality, equity, access, and financial sustainability of health services. Because HSR programs vary from country to country, the recommendations will need to be adapted to local situations.

For HSR program planning

1. Recognize that product availability at SDPs, and the logistics system performance required for ensuring it, are necessary conditions for achieving HSR goals, as follows:
    - Improving equity and access so that all clients, regardless of location, receive the products they need when visiting SDPs.
    - Making a wide range of products available as part of good quality care.
    - Making preventive care products, such as contraceptives, ORS, vitamin A, and vaccines, available as a precondition to containing the costs of care and improving financial sustainability.
2. Accept the fact that achieving and sustaining product availability requires large and long-term investments, not only for the products themselves, but also for developing logistics systems and capacitating staff to operate them.
3. Engage logistics experts—including vertical logistics systems managers—early in the HSR planning process, to develop realistic system designs and implementation plans.
4. Recognize that an LMIS is essential for ensuring product availability and efficiency; that an LMIS requires extensive development and testing; that a vertical program LMIS is vulnerable to disruption by HSR innovations; that data collected by an HMIS are typically not substitutes for LMIS data; and, finally, that disrupting a pre-existing LMIS moves HSR away from its stated goals, not toward them.
5. Recognize that HSR inevitably requires governments to handle politically sensitive challenges. These challenges include managing competitive and transparent procurement processes, changing the employment status of personnel, and privatizing logistics operations. Accordingly—
    - At the planning stage, be "streetwise" enough to recognize that in some cases local realities will not permit governments to meet these challenges, and do not make unrealistic assumptions. For example, HSR implementers often call for reassigning staff from civil service to direct employment by local boards, only to find that, after considerable time, money, and credibility are wasted, that this is politically impossible.
    - For those cases where overcoming political challenges is feasible, allow for the time and expense involved in working with the government to prepare for unpopular changes. For example, although the process is difficult, it has been possible to privatize central storage facilities and transport operations.

Planning for integration

6. Recognize that pre-existing vertical logistics systems are often effective at ensuring product availability. Do not replace them with integrated systems until the new systems work as well in practice as they do in theory. When planning the merging of these systems, aim to bring the new system to the level of the best performing vertical system as a minimum condition for integration. Incremental integration is more likely to produce good results than a "big bang" method.
7. Recognize that integration is not an "all or nothing" proposition. It can be pursued incrementally. Good results have been achieved with storage and transport, especially at the central level. This is a good place to start.

8. Recognize that thus far, it has been more difficult to achieve good results for storage and transport at district and SDP levels. Significant efforts must be made in training and supervision to achieve and sustain good results at these levels.

9. Ensure that inventory control strategies for all important product categories are defined, and that appropriate training takes place, before integrating any function.

10. Recognize that integrated logistics systems must handle at least three categories of supplies:
    - Those in full supply, such as contraceptives and a few essential drugs.
    - Those in short supply, such as most essential drugs, expendable medical supplies, and diagnostic materials.
    - Those requiring special handling, such as vaccines and some diagnostic supplies.

Planning for decentralization

11. Recognize that the appealing concept of decentralization cannot work without logistics support, and that achieving good support requires extensive preparation and communication.

12. Recognize that it is neither feasible nor desirable to decentralize all logistics functions. LMIS, product selection, procurement, and quality assurance are most efficiently handled at the central level. Failure to recognize this will compromise achievement of HSR goals. For example, only centralized procurements can achieve the low unit prices required to contain costs of care and, thus, maximize the use of scarce resources for products in short supply.

13. Ensure that financing is sufficient to get adequate supplies to districts; otherwise, there is no point in decentralizing logistics decision making.

14. Require districts where decentralization programs are being implemented to stock contraceptives and other preventive products.

15. Provide district and SDP staff with the skills they need to make logistics work before decentralization takes place. Historically, staff at these levels have had little need for such critical skills as rational financial planning and needs quantification, and special efforts must be made to provide them.

16. Ensure that training programs aimed at providing missing skills are substantial and competency-based and provide for periodic followup.

17. Ensure that supervision aimed at logistics takes place and that feedback mechanisms are operational between central and local levels. After LMIS data flows up the system, it should be analyzed and fed back down to local levels to improve operations.

Planning for cost recovery

18. Recognize that there are significant short-term logistics implications—for example, significant decreases in demand—associated with the introduction of user fees for family planning products. Ensure that strategies are in place to deal with the consequences so that disruptions to logistics systems are minimized.

19. Recognize that worldwide, drug sales operations in the public sector have not been very successful when their goals are recovery of high percentages of product acquisition and operating costs, for example with revolving drug funds. The probability of achieving sustained product availability through this financing method is low for drugs and nonexistent for contraceptives.

20. Recognize that modest charges, which do not dampen demand, can make important contributions to logistics operations. Though such revenues may not be sufficient for new product acquisition, they can be retained locally to supplement salaries or pay for transport or facility maintenance.

Planning for privatization

21. Take into account the advance preparation required where privatization means working more extensively through NGOs to provide family planning services and contraceptives. For example, MOH staff must be authorized to provide contraceptives and other products to NGOs. And NGO staff may be expected to provide LMIS reports that are new to them. Recognize that NGOs vary considerably in mission, size, and management capacity, and that standard, "one size fits all" arrangements will not produce good results. Tailor arrangements with NGOs to their individual capacities.

22. Be certain that real benefits will result before implementing privatization. Because of political resistance, even modest forms of privatization can be difficult to bring about. Contracting out transport is an example. A local transport market may not, in fact, provide a better alternative to existing public-sector services. If an unqualified contractor is engaged and does not perform well, the entire concept of privatization will be discredited.

23. Prepare governments to manage privatized operations. Some attempts at privatization fail, not because the contractors are unqualified, but because government staff have no experience in monitoring the performance of others as opposed to doing the job themselves. Accordingly, before going forward with privatization activities, ensure that supervisory government staff have the ability to draw up realistic contracts, supervise performance, identify and correct noncompliance, and—very importantly—make timely payment for services rendered.

Planning for contraceptive security

24. Establish a forum in which government, donor, and development bank stakeholders can meet to develop plans for contraceptive security that include all four of the conditions family planning programs must meet. A predictable reaction from many would be, "We already have that." Although in many countries, stakeholders do meet and make joint plans for the short term, few if any make plans that are sufficiently comprehensive or oriented toward the future. An appropriate objective is to develop "rolling five-year plans" for financing and logistics system improvement. Such plans can be updated from year to year.

25. Begin work on those conditions for contraceptive security for which progress is possible. Although it will take time and much dialogue to coax financial commitments from donors, it is possible to make progress on creating the capacity to forecast or improve distribution. This is a restatement of recommendations already made; it is included here to suggest practical ways in which HSR can contribute to contraceptive security.

Appendix A.
Family Planning Context: Demand, Supply, and Unmet Need

Demand

Modern Method Prevalence

The countries of sub-Saharan Africa, especially in West Africa, have some of the lowest levels of modern contraceptive use in the world. In the four countries examined in this study, total contraceptive prevalence ranges from a low of 18 percent in Tanzania in 1996 to a high of 39 percent in Kenya in 1998 (table A-1). Modern method use accounts for roughly 50–81 percent of total prevalence. Since the late 1980s and early 1990s, trends in the composition of contraceptive prevalence indicate an increase both in the level of modern method use and the proportion of total prevalence accounted for by modern methods. By 2010, according to projections, modern method use will account for 73–85 percent of total contraceptive prevalence in the four countries. Growth in the proportion of modern method use will be greatest for Ghana and Zambia.

Table A-1. Past, Current, and Projected Future Contraceptive Prevalence Levels, by Country

Country	Percent Total Prevalence	Percent Modern Method Prevalence	Percent of Total Prevalence Accounted for by Modern Methods
Ghana			
1988	12.9	5.2	40.3
1993	20.3	10.1	49.8
2010	39.7	29.0	73.0
Kenya			
1984	17.0	9.6	56.5
1998	39.0	31.4	80.5
2010	57.0	48.3	84.7
Tanzania			
1991	10.4	6.6	63.5
1996	18.4	13.3	72.3
2010	33.5	26.8	80.0
Zambia			
1992	15.2	8.9	58.6
1996	25.9	14.4	55.6
2010	44.0	33.3	75.7

Source: Ross et al. 1999.

Number of Contraceptive Users

Currently, the number of contraceptive users ranges between almost half a million women in Zambia to 2.4 million women in Kenya. In the next decade, the number of users in the four countries will nearly double, placing intense pressure on the family planning infrastructure and its supporting systems (see table A-2).

Table A-2. Current and Projected Number of Contraceptive Users, by Country

Country	Contraceptive User Estimates/Projections	Projected Increase in Number of Users between 2000 and 2010 (%)
Ghana		
2000	1,270,000	
2010	2,372,000	86.8
Kenya		
2000	2,377,000	
2010	4,073,000	71.4
Tanzania		
2000	1,455,000	
2010	2,966,000	103.8
Zambia		
2000	491,000	
2010	929,000	89.2

Source: Ross et al. 1999.

Client-Based Method Mix

In all four countries, spacing methods are the lead choice among the majority of modern method users. Currently, use of spacing methods accounts for an estimated 80 percent of modern method use in Kenya, 86 percent in Tanzania, 90 percent in Ghana, and 85 percent in Zambia (Ross et al. 1999). Pills and condoms are the preferred modern methods in Ghana and Zambia, and injectables and pills are preferred in Kenya and Tanzania. According to client-based method-mix projections, over the next five years increases in female and male sterilization will decrease the proportion of modern-method prevalence accounted for by spacing methods, with the greatest percentage-point differences expected in Ghana and Zambia (table A-3).

Table A-3. Percentage of Past, Current, and Projected Modern-Method Prevalence, by Country

Country	Modern Method Prevalence	Sterilization	Pills	Injectables	IUDs	Condoms	Vaginals
Ghana							
1988	5.2	1.0*	1.8	0.3	0.5	0.3	1.3
1993	10.1	0.9*	3.2	1.6	0.9	2.2	1.2
2010	29.0	8.6	9.7	2.7	4.8	2.5	0.7
Kenya							
1984	9.6	2.6*	3.1	0.5	3.0	0.3	0.1
1998	31.4	6.1*	8.5	12.6	2.7	1.3	—
2010	48.3	10.9	11.6	18.1	3.3	4.0	0.4
Tanzania							
1991	6.6	1.6*	3.4	0.4	0.4	0.7	—
1996	13.3	1.9*	5.5	4.5	0.6	0.8	—
2010	26.8	6.7	8.9	6.3	3.5	1.2	0.2
Zambia							
1992	8.9	2.1*	4.3	0.1	0.5	1.8	0.1
1996	14.4	2.0*	7.2	1.0	0.4	3.5	0.1
2010	33.3	10.6	11.2	2.5	5.3	3.5	0.2

* Exclusively female sterilization
Source: Ross et al. 1999.

Unmet Need

Unmet need for contraception is high in the four countries of interest, reflecting a sizable gap between women's fertility desires and their contraceptive behavior (table A-4). Roughly one of every three women of reproductive age in Ghana and Kenya have an unmet need for contraception, compared to about one in four or five in Tanzania and Zambia. Despite the predominance of spacing methods in the client-based method mix, the unmet need for spacing methods is higher than the need for limiting methods in all four countries. Between 66 and 81 percent of women with an unmet need for contraception intend to use contraception in the future.

Table A-4. Percentage of Unmet Need for Spacing and Limiting Methods, by Country

Country	Total Unmet Need*	Unmet Need for Spacing Methods	Unmet Need for Limiting Methods	Percent Users with Unmet Need Who Intend to Use Contraception
Ghana (1993)	33.0	23.8	9.2	66.8
Kenya (1998)	35.5	21.3	14.2	72.1
Tanzania (1996)	23.8	15.3	8.5	66.0
Zambia (1996)	26.6	18.7	7.9	80.8

* Among all married women.
Source: Ross et al. 1999.

Supply of Family Planning Services

Overall, the public sector in three of the four study countries provides services to a majority of contraceptive users, with the proportion of users served ranging from a low of 43 percent in Ghana to a high of 74 percent in Tanzania (table A-5). By method, public programs are the lead suppliers of all spacing methods, except for pills and vaginal methods in Ghana and condoms in all countries. The role of private medical and retail sectors in supplying users is significant for condoms and increasingly important for other methods.

Table A-5. Percentage of Public-Sector Provision of Reversible Contraceptives, by Country

		Public Sector Supply					
Country	**Total**	**Pills**	**IUDs**	**Injectables**	**Vaginal Methods**	**Condoms**	**Implants**
Ghana (1993)	43.3	36.9	87.1	85.7	24.5	16.8	100.0
Kenya (1998)	58.0	52.8	66.7	64.0	0.0	21.2	51.6
Tanzania (1996)	74.2	77.4	90.8	88.4	100.0	22.8	82.4
Zambia (1996)	59.9	74.9	59.0	70.9	70.2	39.6	—

Health Sector Reform and Delivery of Family Planning Services

Different aspects of health sector reform have been implemented in the four countries, with the most intensive efforts beginning in the mid-1990s. In terms of family planning supply, HSR strategies have included reformulation and adoption of national multisector population policies, establishment of national population committees, inclusion of family planning and reproductive health services in the ESPs, addition of selected contraceptives to EDLs, development of service delivery and training guidelines designed to standardize and improve the technical quality of care, service integration, decentralized planning and management of health services, and financing schemes. The scope and success with which reforms have been implemented is addressed in appendices E–H.

Appendix B.
Study Protocol

The study protocol discussed below is a generic version that outlines the study objectives, methods, and data analysis used to develop the case studies for Ghana, Kenya, Tanzania, and Zambia. Highlighting the role that health sector reform activities have played in the functioning of logistics systems, the protocol was developed to ensure good quality data in all studies and enable comparisons among countries. Following this protocol, the study team developed separate generic instruments for use in each country. An example of a tailored district-level instrument for Zambia appears in appendix C.

Study Objectives

The objectives of this comparative study are:

- To understand how HSR is affecting contraceptive availability and specific logistics functions, such as logistics management information systems, financing, product selection, forecasting, procurement, storage, transport, and human resources.
- To investigate the associations between HSR and logistics, and to compare these relationships among countries, showing similarities and differences and making general conclusions and recommendations.

Study Team

The comparative study was implemented by a team of FPLM core staff and consultants from John Snow, Inc. and specialists from The Futures Group International, a subcontractor of FPLM. In addition, local professionals were recruited from each country in the study. The team worked closely with USAID's Contraceptive Logistics Management Division, USAID country missions, and MOH counterparts to finalize study design, gather and analyze information, prepare individual country studies, and prepare the final report.

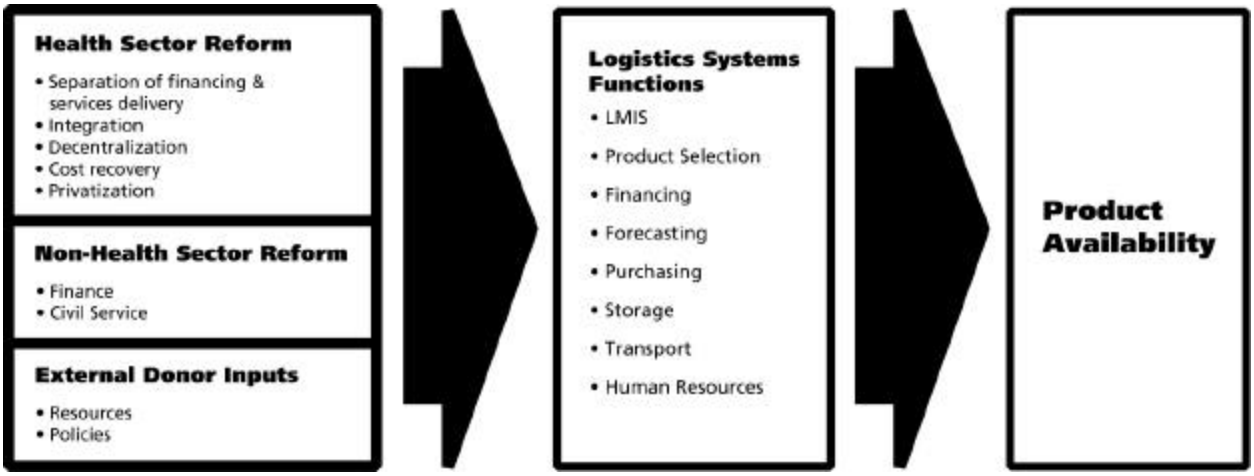
Peer Review Process

A peer review panel was set up to provide feedback to the study team for each piece of the study. Four individuals recognized for their experience in public health, family planning, or health sector reform agreed to be panelists: Thomas Bossert, Harvard University; John Crowley, USAID; Rachel Feilden, Feilden-Battersby Associates, UK; and Richard Laing, Boston University. The panel's input has been indispensable for focusing discussions and assuring quality.

Analytical Framework

Figure B-1 illustrates the analytical framework for this study. Independent variables are listed on the left: including HSR program content, non-HSR reforms, and donor policies and resources. Dependent variables are shown in the two boxes to the right; they are the eight logistics systems functions listed for the first objective, plus product availability, making nine altogether.

Figure B-1.
Analytical Framework for Study



The horizontal arrows represent the main axes of inquiry. They represent the relationships, borne out by the study findings, between independent and dependent variables, based on the following assumptions:

- Over defined periods of HSR, in given country contexts, there will be changes in the dependent variables.
- Some of the changes in the dependent variables may be plausibly associated with HSR. These associations can be supported by study findings.
- Some of the changes in the dependent variables may be related to non-HSR factors.

With regard to the dependent variables, the focus of this study is on contraceptive logistics. Noncontraceptive logistics systems, particularly those for essential drugs, also receive attention to draw comparisons with contraceptive logistics systems.

Sampling

The sample design has four elements: countries first, and then, within each country, central MOH, regions, districts, and SDPs. The country sample is a convenience sample. Criteria for selecting the countries to visit include:

- USAID-funded FPLM program in operation,
- definable HSR program, and
- USAID Mission and MOH in the country agreed to participate in the study.

For Zambia and Ghana, the team prepared country case studies based on a protocol for data to be collected through a sample survey. In these two countries, apart from central MOH, the samples consisted of 2 regions, 5 districts, and 15 SDPs selected purposively. Criteria for selecting regions and districts were as follows: half were sites perceived to be doing well with the HSR program, and half were sites perceived to be doing less well. Within districts, the team visited an average of three SDPs, with one geographically close to the district health office, one a half day's drive away, and the third on the route out of town.

In Kenya, time and money constraints limited the data collection to the central level. Tanzania was included in the country sample, not as a purpose-built case study, but as an opportunity that presented itself when two FPLM staff members visited that country on a contraceptive technical assistance assignment. For Tanzania, the SDP sample was 23 sites. Given the nature of the work for Kenya and Tanzania, team members used the protocol and standard questionnaires as general guidelines only and did not make country-specific adaptations.

Information Sources

Although the team used varied approaches to data collection according to the circumstances in a country, the types of sources were consistent across the country sample, as follows:

- Relevant country documents, such as policy guidelines, work plans, studies, and consultancy reports.
- Key informant interviews with host-country and donor staff.
- Logistics records, such as stock record cards and LMIS reports.

Hypotheses and Methods

This study tests two hypotheses:

- Vertical contraceptive logistics systems are effective means for improving service to clients by improving product availability.
- Health sector reform innovations can disrupt specific logistics functions.

The study did not test these hypotheses in a statistically significant manner. Rather, it used a convenience sample of countries, regions, districts, and service delivery points (SDP) to gather qualitative and quantitative data on a set of 40 prespecified indicators.

The study team used an eight-step method to collect data for the purpose of enabling comparisons across countries:

1. Development of a generic study protocol that was tailored to fit country-specific contexts, as discussed above. It outlines the country selection criteria, information sources, data analysis methods, and indicators.
2. Specification of quantitative and qualitative indicators of logistics system performance, based on dependent variables described in table B-1.
3. Review of relevant health sector reform and logistics-related literature for each country.
4. Development of generic data collection instruments, subsequently pilot-tested and modified to fit country contexts. The district-level instrument adapted for Zambia is given in appendix C.
5. In-country data collection in Zambia, Ghana, Kenya, and Tanzania.
6. Preparation of individual case studies for all four countries.

7. Creation of summary tables. The tables in appendix D distill the periodicity and content of each country's HSR program, and tables comprising appendices E–H provide qualitative information and descriptive statistics for each dependent variable for each country.

8. Preparation of a synthesis table showing the dependent variables and the indicator results for each country. This table (appendix I) provides the basis for the findings.

The Indicators

The indicator-based approach used in this study has advantages and disadvantages. Advantages include—

- They are useful for describing complex phenomena such as logistics operations because they can be based on a broad range of quantitative and qualitative data.
- They can be tailored to suit the types of data that can be feasibly collected.
- They are useful for making comparisons across countries, an advantage strengthened by the broad similarities in contraceptive and drug logistics operations in the sample countries in this study.
- They can be examined and questioned by reviewers.

Disadvantages include—

- They do not demonstrate causality; they can only facilitate comparisons of qualitative information.
- Their objectivity can be compromised by analysts' biases. The greatest danger is in the selection of particular indicators, but the manner in which they are derived can also reflect bias.

The 40 indicators defined in table B-1 were derived as follows:

- Direct quantitative measures, (e.g., availability of contraceptives at SDPs or stock levels at SDPs).
- Presence or absence of a desirable practice (e.g., appearance of contraceptives on national essential drug lists or purchase-order quantification based on consumption or issues data).

In developing the indicators, the team confronted the familiar problems of unevenness and incompleteness of data. Although the indicators finally selected are not optimal in all cases, they accurately describe the status of the variables at the time of the study. To minimize the disadvantages of this indicator-based analysis, we exercised caution in interpreting the findings.

Table B-1. Definitions of Indicators for Variables of Analysis

Indicator	Definition
Product Availability	
Satisfactory supply levels of contraceptives at SDPs at time of study	Availability of the complete method mix at 70% of SDPs.
Satisfactory supply levels of drugs at SDPs at time of study	Availability of the set of unexpired indicator drugs at 70% of SDPs in the sample.
LMIS	
Contraceptive LMIS exists	Presence in each country's public health system of an information system in which key logistics data on contraceptives (consumption, stock balances, receipts, losses, and adjustments) are collected at SDPs, aggregated at higher levels, and transmitted to the central level in periodic reports.
Drug LMIS exists	Presence in each country's public health system of an information system in which key logistics data on drugs (consumption, stock balances, losses, and adjustments) are collected at SDPs, aggregated at higher levels, and transmitted to the central level in periodic reports.
Contraceptive LMIS functions effectively	Accurate completion and timely submission of reports at all levels so that key logistics data from the reports can be used systematically to manage contraceptive stock levels (determine resupply and transfer quantities).
Drug LMIS functions effectively	Accurate completion and timely submission of reports at all levels so that key logistics data from the reports can be used systematically to manage drug stock levels (determine resupply and transfer quantities).
Implementation of HMIS has negatively affected contraceptive LMIS	Any of the following: the entire LMIS has been officially discontinued and replaced by the HMIS; due to the implementation of the HMIS, SDPs no longer complete and submit forms and reports that collect logistics data for the contraceptive LMIS, thus compromising the viability of the entire LMIS; or due to implementation of the HMIS, logistics data are collected by means other than the LMIS (including through the HMIS), but are not aggregated on a timely basis and cannot be used for decision making.
Implementation of HMIS has negatively affected drug or vaccine LMIS	Any of the following: the entire LMIS has been officially discontinued and replaced by the HMIS; due to the implementation of the HMIS, SDPs no longer complete and submit forms and reports that collect logistics data for the vertical LMIS, thus compromising the viability of the entire LMIS; or due to implementation of the HMIS, logistics data are collected by means other than the LMIS (including through the HMIS), but are not aggregated on a timely basis and cannot be used for decision making.

Indicator	Definition
Product Selection	
Contraceptives appear on EDL	Contraceptives that make up over 50% of the resupply method mix* appear on the national EDL by generic name.
Recent rationalization of contraceptive method mix	MOH unit responsible for family planning and reproductive health reviewed or updated the contraceptive method mix provided through the public health system within the defined HSR period.
Adherence to national EDL for drug procurement	MOH drug procurement at the central level limited to products on the national EDL.
Financing	
Sustainability of contraceptive financing	Contraceptive acquisition and operational costs fully financed through MOH budgetary funds.
Systematic coordination for contraceptive financing	Both of the following: regular, formal meetings to coordinate contraceptive funding and provision take place between the MOH unit responsible for managing contraceptives and all donors providing contraceptives; and decision making and coordination at these meetings is based on contraceptive forecasts using consumption or issues data.
Sustainability of drug financing	Either of the following: drugs are fully financed through MOH funds; or financing mechanism is in place, achieving the total recovery of drug acquisition and operational costs.
Systematic coordination for drug financing	Both of the following: regular, formal meetings take place between the MOH's drug procurement management unit and any donors providing drugs to coordinate present and future drug funding and provision; and decision making and coordination at these meetings is based on drug forecasts using consumption or issues data.
Provision of basket funding or block grants for districts	District health management teams, local district health boards, or local district councils receive dedicated grants from the pooled funding account (basket funding) as part of their budgetary allocation.
Forecasting	
Forecasting for contraceptives carried out	Annual estimation of a country's contraceptive needs based on demographic and logistics data for periods of time into the future longer than the current procurement schedules.
Forecasting for drugs carried out	Annual estimation of a country's drug needs based on demographic and logistics data for periods of time into the future longer than the current procurement schedules.

Indicator	Definition
Purchasing	
Contraceptive quantification for procurement based on consumption or issues data from lowest level possible	High quality logistics data in any of the following forms: Dispensed-to-user or consumption data from SDPs, or issues data from the district level to the SDP level.
Drug quantification for procurement based on consumption or issues data from lowest level possible	High quality logistics data in any of the following forms: dispensed-to-user or consumption data from SDPs; data on issues from the district level to the SDP level; data on drug sales to SDP levels; or calculations based on the content of a standard EDP kit, the number of sites to which the standard kits are distributed, and the periodicity with which kits are distributed.
Effective execution of contraceptive purchases	One or more donors routinely manage procurement.
Effective execution of drug purchases	MOH routinely manages international competitive procurements.

Indicator	Definition
Storage and Inventory Management	
Integrated storage at central level	Contraceptives, drugs, and other supplies stored at the same location at the central level in either of the following ways: (a) storage in different sections of a warehouse; or (b) different storage buildings located on the same grounds of the central-level storage facility. Although optimal efficiency is achieved when all commodities are managed by the same staff, this is rare. Thus, integrated storage may also includes either of the following: contraceptives, drugs, and other supplies stored together (as per definitions in a and b) and managed by the same staff; or contraceptives, drugs, and other supplies stored together but managed separately.
Satisfactory quality of stores management at central level	Both of the following: score of 70% or higher based on the standard FPLM checklist to assess storage conditions; and storage facility has sufficient staff to ensure the security and effective storage of products.
Integrated storage at district and SDP levels	At the district level, contraceptives, drugs, and other supplies stored in the same room or store. Although optimal efficiency is achieved when the same staff also manage all commodities, this is rare. Integrated storage thus also includes either: contraceptives, drugs, and other supplies stored in the same room and managed by the same staff; or contraceptives, drugs, and other supplies stored in the same room but managed separately. Storage is considered integrated at the SDP level if there is one dedicated storage area (e.g. room, cupboard) in a facility for all products, managed by the same staff; or managed separately.
Satisfactory quality of stores management at district and SDP levels	Both of the following: score of 70% or higher based on the standard FPLM checklist to assess storage conditions, and storage facility or area is sufficiently staffed to ensure the security and effective storage of products.
Effective inventory management of contraceptives at districts and SDPs	Either of the following: 50% or more of districts and SDPs maintain contraceptive stock levels for indicator products between preestablished max/min levels; or 50% of indicator contraceptives are stocked between preestablished max/min inventory levels at districts and SDPs.

Indicator	Definition
Transport	
Central to district resources adequate for contraceptives	Availability of adequate transportation resources and management of the resources to ensure contraceptives are distributed from the central level to districts on a regular schedule.
Central to district resources adequate for drugs	Availability of adequate transportation resources and management of the resources to ensure drugs are distributed from the central level to districts on a regular schedule.
Central to district is integrated	Contraceptives, drugs, and other supplies are transported in the same vehicle at the same time from the central to the district level on a regular, systematic schedule.
District to SDP resources adequate for contraceptives	Availability of adequate transportation resources and management of resources to ensure contraceptives are distributed from districts to SDPs on a regular schedule.
District to SDP resources adequate for drugs	Availability of adequate transportation resources and management of the resources to ensure drugs are distributed from districts to SDPs on a regular schedule.
District to SDP is integrated	Contraceptives, drugs, and other supplies are transported in the same vehicle at the same time from districts to SDPs on a regular, systematic schedule.
Human Resources	
HSR-related change in employment status has affected MOH staff	Civil service reform resulting in the majority of employees at district and SDP levels in the health sector being employed by local boards or local governments rather than the MOH.
Logistics training has taken place	Staff at district and SDP levels have received competency-based training in logistics.
Logistics functions covered by training are carried out effectively	Execution of a list of key tasks across SDPs and districts covered by training.
Supervision of SDPs takes place	More than three-quarters of SDPs report receiving regular supervisory visits within a defined time.
Supervision of SDPs focuses on logistics	Evidence that supervisory staff have focused on the logistics tasks covered by recent training activities during supervisory visits.

* Resupply methods are those that rely on a well-functioning logistics system to guarantee their availability, including pills, injectables, condoms, IUDs, implants, and vaginal foaming tablets.

‡ Stores management refers to receiving, organizing, storing, controlling and issuing stock, good housekeeping and providing shelter secure from theft, moisture, and pests.

Appendix C.
District-Level Data Collection Instrument Adapted for Zambia*

* The following instrument has not been edited since its use in the field.

John Snow, Incorporated

Family Planning Logistics Management Project

Implications of Integration and Other Elements of Health Sector Reform for Family Planning Logistics

Instrument C : District Level Questionnaire

Date ___/___/___ Form # N/S_____ Interviewer _____ District _____

Respondent Information

Title : **_____ Qualification :** **_____**

Length of time in current position : _____ years _____ months

---

Topics Covered in this Interview

[ ] I. Health and Family Planning Services

[ ] II. Health Reform Program

[ ] III. Direct Effects of Health Sector Reform on Contraceptive Logistics

( ) General Questions ( ) Finance-Related ( ) Human Resources

( ) Quantification ( ) Stores Management ( ) Transport

[ ] IV. Indirect Effects of Health Sector Reform on Contraceptive Logistics

Notes (Follow-up questions, other contacts):

Interview Start Time **Interview** **_____ End Time _____**

---

*(**Note:** Thank respondent for taking the time to meet with us. State who we are, explain the objective of the study, define 'health sector reform/changes' and 'logistics management', state who else we will be talking to (broad categories), gain support/permission for interviewing staff at lower levels.)*

I. Health and Family Planning Services

*(**Interviewer:** "We would like to begin by addressing health service delivery in Zambia.")*

C101 In your opinion, what are the most important issues or problems facing the following programs or services in this district?

***(Note:** Prompt for at least one answer in each category.)*

- Reproductive Health and Family Planning
- Primary Health Care
- Immunization
- STD/HIV

II. Health Reform Program

*(**Interviewer:** " In recent years, Zambia has implemented an extensive program of Health Reform. We would like to begin by briefly discussing your impressions.)*

C201 How have the reforms affected work within this district?

(***Note:*** *This open-ended question is intended to get at general effects of any changes that have taken place. It sets the stage for the more focused questions that follow on indirect and direct effects on contraceptive logistics. Be prepared to prompt responses for the topics below.)*

- Division of MOH into MOH and CBOH
- Decentralization and creation of District Health Management Teams
- Integration of Health and Family Planning Services
- Integration of Logistics Services
- Cost Sharing
- HMIS and /or FAMS
- Other Health Reform related training activities

III. Direct Effects of Health Sector Reform on Contraceptive Logistics System

***(Interviewer:** "The effect of changes in the health sector, especially that of health sector reform, is far-ranging. We are interested in discussing ways in which these changes have both directly and indirectly affected the logistics system. Let's begin with the current state of the logistics system.")*

6. General Questions

C301 In your opinion, what are currently the most important logistics problems facing contraceptives, essential drugs, vaccines and lab supplies ?

***(Note:** Within each product category, prompt for logistics components: Financing, Human Resources, Quantification, Stores Management and Transport.)*

C302 How have the Health Reforms affected logistics management for contraceptives, drugs, vaccines and lab supplies?

***(Interviewer:** Refer to C201 in previous section. Prompt for ways in which the specific health reforms have affected logistics for these product categories, but with emphasis on contraceptives.)*

Finance-Related

C303 In terms of financing for contraceptives, drugs, vaccines and laboratory supplies are there any important differences between the way things are now and before the health reforms started? If so, can you describe the differences?

***(Note:** The two main possibilities are: First, that the amounts of financing or products available may have changed; and second, the procedures for budgeting and managing funds may have changed. Probe to get details on these points, as well respondents opinions on the whether any changes are beneficial or not beneficial. Probe for details concerning each of the product categories of contraceptives, drugs, vaccines and lab supplies.)*

TAB

C304 Record below the names, units and purchase prices for up to 15 drugs purchased directly by the district for the most recent purchases executed (1999 only).

***(Note:** Districts have two sources of drugs. One is an account with EDMSS; and the other is direct purchase from commercial suppliers with district funds. The purpose of this question is to be able to compare the unit costs of locally purchased drugs with centrally purchased drugs.)*

Brand Name	Generic Name	Form and Strength	Unit	# Units in Purchase Pack	Purchase Pack Price	Unit Cost	On EDL (Y/N)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Human Resources

(Interviewer: "*Now we would like to ask some questions about the staff who work in logistics.")*

C305 Since the beginning of the Health Reform program, have there been any changes in the staff available to work on logistics for contraceptives, drugs, vaccines or laboratory supplies? If there have been changes, can you describe them?

*(**Note:** Possible answers include: No changes; more or fewer personnel available; changes related to qualifications of staff available; and comments related to any training that has taken place. Probe for the respondent's opinions on whether or not any changes mentioned have been beneficial or not beneficial.)*

C306 Is there one party, such as a logistics officer, in charge of all district level logistics?
[ ] Yes [ ] No

Are there individuals designated as being in charge of different types of supplies, such as contraceptives, essential drugs, vaccines or laboratory supplies?
[ ] Yes [ ] No

Who fills these positions and what are their titles?

(***Note****: Typically, contraceptives are managed by the public/family health nurse; drugs by the pharmacy technician; vaccines by the public/family health nurse; and laboratory supplies by the lab technician. It is yet unclear if districts have one overall logistics officer or "coordinator," and if they do, who usually fills that position. Probe to find out how the parties who manage different types of supplies relate to one another and how coordination is achieved. Make sure respondent also identifies himself or herself if applicable.*)

C307 What are the logistics responsibilities of the parties identified in the preceding question? For example, what roles do they play in quantification and selection, receiving, storage, issuing and transport?

(Note : Probe for each type of commodity. Make sure respondent also describes his/her own role if applicable.)

C308 Have the roles and numbers of staff working on logistics for contraceptives, drugs, vaccines and lab supplies changed since the health reform program began?

[ ] Yes [ ] No

If “yes,” what changes have taken place?

TAB

C309 Have the personnel mentioned above received any training on logistics management?

[ ] Yes [ ] No

If yes, what types of training have taken place? (Note: answer and then fill in table below)

If no, do you know why no personnel have received training?

*(**Note:** At least three types of information transfers for logistics training aimed at district level staff have been provided since 1997. They include: Stores management, quantification and DILSAT. Stores management training has taken place for all districts. Orientation for quantification was provided for all districts at inter-district meetings. DILSAT training has been pilot tested in two districts only.*

List the staff members who have received training.

Type of Training	Names and Positions of Trained Staff	Dates of Training/ Organizers of Training
Stores Management	**1.** **2** **3.** **4.** **5.**	**1.** **2** **3.** **4.** **5.**
Quantification	**1.** **2.** **3.** **4.** **5.**	**1.** **2.** **3.** **4.** **5.**

C310 For the training that has taken place, has it been useful? What improvements has it brought? How could the training be improved?

***(Note:** Probe to find out if: Enough staff have been oriented; if orientation was effective in giving staff skills to do their jobs better; if training has been frequent enough; or if any follow up from the trainers has taken place.)*

TAB

C311 Have district staff who have received training passed their new skills on to others, either at district or at health facilities?

How many people have received training? _____ at districts

_____ at health facilities

(Note: For Stores management training, the intended plan was for the district staff who had been trained to train others, specifically, to train health facility staff in accordance with the manual. Probe to find out if this has been done, what district staff think of the results, and what problems were encountered. Ask to see documentation of training.)

TAB

C312 Is there a budget line item for "supervision" under the Planning Cost Center? If the answer is "yes," how much is budgeted for the current year? Is there a schedule of regular supervisory visits for health facilities? How often do health centers receive supervisory visits?

(Note: The measures listed above are called for in the District Health Planning Guide. Probe to find out if they are in place. If answers are affirmative, ask to see documentation. If these measures are not in place, ask questions to find out why not.)

Budget line item for supervision exists: Yes [ ] No [ ] If not, do you know why not?

Amount budgeted for 1999 _____

Amount spent to date_____

Supervisory schedule exists: Yes [ ] No [ ]

Frequency of supervisory visits to facilities_____

Who conducts supervisory visits? _____

What items are covered under supervision?

Quantification

C313 Have there been any changes in the way(s) the district plans its needs for contraceptives, drugs, vaccines or laboratory supplies since health sector reform began?

***(Note:** It is understood that decentralization and creation of the District Health Management Boards with responsibility for their own budgets is one of the fundamental changes introduced by the health reform program. Following the initial response, probe to find out how the respondent feels about this process: How well is this approach working; what have been the benefits; and what have been the problems?)*

TAB

C314 Does the district have a "Planning Working Group" to quantify needs for contraceptives, drugs, vaccines and lab supplies?

Planning working group exists Yes [ ] No [ ]

If "yes," who leads this group, and who are the members?

***(Note:** According to the Manual on Quantification of Medical Supplies, such a group should be designated, headed by the manager planning and staffed by the pharmacy technician, lab technician and public health nurse. Probe to understand if such a group exists and who participates)*

List the members – note the leader of the group first.

Name and Position	
1.	**5.**
2.	**6**
3.	**7.**
4.	**8.**

TAB

C315 Have any district staff attended orientation sessions on selection and quantification?

Staff have attended orientation on selection and quantification Yes [ ] No [ ]

If "yes," who has attended and what are their positions? When did they attend this orientation?

***(Note:** Orientation sessions, based on the Manual for Quantification of Medical Supplies have been given, but not all districts have been covered.)*

List staff oriented in quantification.

Name and Position	**Dates Oriented**
1.	**1.**
2.	**2.**
3.	**3.**
4.	**4.**

TAB

C316 Is a copy of the *Manual on Quantification of Medical Supplies* available?

Quantification manual available Yes [ ] No [ ]

Who has this document?

(***Note:** Verify that manual is present; ask to see it.)*

C317 How are needs for contraceptives quantified? What steps are carried out? Can you describe what types of information are used and how the calculations are made? Is the method used in the *Manual* used?

***(Note:** The manual and other publications recommend that contraceptive needs be quantified using the consumption method. The steps are described on pages 23-28 of the manual and a sample spread sheet is given in Annex 4 of the manual. As noted above, there have been orientations for this. In fact, however, the method recommended in the manual has many steps, and may or may not have been followed. Find out what method was used, what information was used, and describe in detail.)*

Stores Management

***(Interviewer**: "We would now like to examine the effects of the Health Reform program on the storage practices for contraceptive products and materials.")*

C318 Have there been any changes in stores management for contraceptives, drugs, vaccines and lab supplies at the district since the health reform program began? If there have been changes please describe them.

*(**Note:** Record the answers given and probe to get the respondent's opinion about whether any changes mentioned have been beneficial or non beneficial.)*

C319 At the district level, are contraceptives, drugs, vaccines and laboratory supplies intended for reissue stored in the same place or are they stored separately? Are contraceptives stored together with drugs or other products? How many separate storage spaces are there? If supplies are stored separately, what is the reason?

***(Note:** For these questions, distinguish between products kept in "dispensing" areas and those kept in "storage" areas from which stock is reissued to the health facilities. The focus is on the latter. Multiple issue points suggest a less efficient distribution operation, although this may be caused by building configuration and availability of space, and not inattention of district staff. Probe to understand how the storage situation affects redistribution.)*

TAB

C320 *(**Note :** this is an observation of the interviewer and not to be asked)*

Characterize the quality of the storage area where contraceptives are kept.

#	Description	Yes	No	N/A
1	Store is separate from dispensing area			
2	Store structure is in good condition (i.e., no holes, cracks or signs of water damage)			
3	There is a ceiling in the store			
4	The ceiling is in good condition			
5	The story is tidy (i.e., no dust on shelves; floor is swept)			
6	Boxes are raised off the floor on pallets, boards or bricks			
7	Products are stored out of direct sunlight			
8	Damaged and/or expired products are separated from good products			
9	The storeroom is well-ventilated			
10	Products are separated by lots			
11	Products arranged according to First Expiry/First Out (FEFO)			

TAB

C321 Is there available a copy of the *Manual on Stores Procedures for District Stores*? Who has this document?

***(Note:** Verify that the document is present; ask to see it.)*

Stores Procedures Manual available Yes [ ] No [ ]

TAB

C322 How often is a physical count carried out? _____

Is the record of the most recent account available?

***(Note:** If a report of physical count is available, ask to see it and record the date(s) on which it was performed.)*

Record of physical count available ? Yes [ ] No [ ]

What is the date of the most recent physical count? _____ / _____ / _____

***(Note:** The following two questions are observations of the interviewer and not to be asked)*

Is the stock control card adjusted to reflect physical counts? Yes [ ] No [ ]

Are losses and adjustments reflected on the stock control card? Yes [ ] No [ ]

TAB

C323 For shipments of contraceptives from the central level to the district, who decides the quantities of each item to be provided?

Center decides [ ] Push

District decides [ ] Pull

Please describe what information is used to determine quantities to ship/order:

***(Note:** Ask questions to ascertain if min/max levels are used. If so get details on how these levels are set.)*

Does the system work as intended? [ ] Yes [ ] No

If not, why not?

If a pull system, do you always receive exactly what you order? [ ] Yes [ ] No

If not, do you know why?

TAB

C324 For shipments of contraceptives from the district to individual health facilities, who decides the quantities of each item to be provided?

District decides [ ] Push

Health facility decides [ ] Pull

Please describe what information is used to determine quantities to ship/order:

***(Note:** Ask questions to ascertain if min/max levels are used. If so get details on how these levels are set.)*

Does the system work as intended? [ ] Yes [ ] No

If not, why not?

If a pull system, do you always receive exactly what you order? [ ] Yes [ ] No

If not, do you know why?

TAB

C325 For the contraceptive products listed below, compare the amount shown in the Stock Control Cards with your own physical count.

(*Note:* *This question has two purposes: The first is to verify the availability of contraceptive products; and the second is to verify the quality of stock record keeping. Concerning the second point, it is possible that you will find a situation where stock has recently been issued and not yet recorded on the stock record cards. In such cases, review the @@Supply Vouchers@@ and record the totals for all stock issued but not yet recorded on the cards in the second column and compute the corrected total. Note that space is given to record separate lots.)*

NOTE : TABLE CONTINUES ONTO NEXT PAGE

Product	Unit	Stocked at this site? (Y/N)	Stock Control Card Count	Vouchers Count (Rec'd/Issued + or -)	Adjusted Count	Physical Count	Lot # and Expiration Date
Microgynon	Cycle/Strip						
Microlut	Cycle/Strip						
Noristerat	Vial						

Product	Unit	Stocked at this site? (Y/N)	Stock Control Card Count	Vouchers Count (Rec'd/Issued + or -)	Adjusted Count	Physical Count	Lot # and Expiration Date
Pregna	IUD						
Neo Sampoon	Tube						
Condom	Condom						
Female condom	Condom						
PC4	Pack						

Product	Unit	Stocked at this site? (Y/N)	Stock Control Card Count	Vouchers Count (Rec'd/Issued + or -)	Adjusted Count	Physical Count	Lot # and Expiration Date
IUD insertion/ Removal kits	Kit						
Tubal-ligation Kits	Kit						
Tubal-ligation Consumable kits	Kit						
Fertility Thermometers	Thermo-meter						

C326 Gather the data indicated below, which is required for computing stock positions. The "Total Units in Stock Now" is taken from the physical count column of the preceding table. The "Total Issued or Lost for Month" is taken from the Stock Record Book.

Product	Microgynon	Microlut	Noristerat	Pregna	Neo Sampoon	Condom	Female Condom	PC4
Unit	**Cycle/Strip**	**Cycle/Strip**	**Vial**	**IUD**	**Tube**	**Condom**	**Condom**	**Pack**
Units of Stock on Hand (Transfer from C325)								
Average Monthly Consumption (Compute using data below)								

Product	Microgynon	Microlut	Noristerat	Pregna	Neo Sampoon	Condom	Female Condom	PC4
Unit	**Cycle/Strip**	**Cycle/Strip**	**Vial**	**IUD**	**Tube**	**Condom**	**Condom**	**Pack**
Total Issued/ Lost for Month								
1999 July								
June								
May								
April								
March								
February								
January								
1998 December								
November								
October								
September								
August								

C327 Have there been any stockouts of any contraceptives in the last six months? [ ] Yes [ ] No

(Note: Clarify that stockouts are defined as “total stockout” , i.e., zero stock on hand)

If yes, check stock control cards and note dates for each stockout by product on the table below. Note reasons for stockouts.

Product	Unit	Stocked at this site? (Y/N)	Beginning Date of Stockout	Ending Date of Stockout	Total number of days stocked out in last 6 months	Reason for Stockout
Microgynon	Cycle/Strip					
Microlut	Cycle/Strip					
Noristerat	Vial					
Pregna	IUD					
Neo Sampoon	Tube					
Condom	Condom					
Female condom	Condom					

Product	Unit	Stocked at this site? (Y/N)	Beginning Date of Stockout	Ending Date of Stockout	Total number of days stocked out in last 6 months	Reason for Stockout
PC4	Pack					
IUD insertion/ Removal kits	Kit					
Tubal-ligation Kits	Kit					
Tubal-ligation Consumable kits	Kit					
Fertility Thermometers	Thermo-meter					

Transport

***(Interviewer:** "Now we would like to talk about the transport systems.")*

TAB

C328 For how many clinical facilities and community-based workers is the district responsible for supplying?

Type	Number
Hospitals	
Health Centers	
Community Based Distributors	
Community Health Workers	
Other	

TAB

C329 How many vehicles does the district have?

Make	Type	Year	Who Owns the Vehicle?	Is it operational ? (Y/N)
1.				
2.				
3.				
4.				
5.				
6.				

TAB

C330 Center and district: For regular operations, does the center deliver to the district, or does the district pick up from the center? What is the frequency of deliveries or pick ups (e.g., monthly, quarterly)?

Center delivers to district [ ] District picks up from center [ ]

Frequency:_____ Frequency: _____

Reason: _____ Reason : _____

(***Note*** *: If both, note the cases in which center delivers to district and cases in which district delivers to center)*

If there is another arrangement, explain what it is.

TAB

C331 District to health center: For regular operations, does the district deliver to the health centers, or do the health centers pick up from the district? What is the frequency of deliveries or pick ups (e.g., monthly, quarterly)?

District delivers to health centers [ ] Health centers pick up from district [ ]

Frequency:_____ Frequency: _____

Reason: _____ Reason : _____

(***Note*** *: If both, note the cases in which center delivers to district and cases in which district delivers to center)*

If there is another arrangement, explain what it is.

TAB

C332 Are contraceptives transported together with drugs, vaccines and laboratory supplies or transported separately?

Together [ ] Separately [ ]

C333 *(**Note:** If contraceptive transport is integrated with other health products, ask the following question.)*

When supplies are delivered to health facilities, what products have priority? Are there occasions when the vehicle is full? If so, what happens?

*(**Note**: Probe to find out which products are left behind; then probe specifically for contraceptives.)*

TAB

C334 Does the District Board ever use commercial transport services for obtaining goods from the center or delivering them to health facilities? Can your describe the commercial transport arrangements? When did this arrangement begin? How has the use of commercial vehicles changed the efficiency and/or effectiveness of distribution? Is there a budget for this?

Use commercial transport Yes [ ] No [ ]

Budget line for transport? Yes [ ] No [ ]

TAB

C335 The CBOH has a facility to assist districts with the purchase of vehicles with funds set aside from district resources. Also, some districts have set up investment accounts and purchased vehicles from the revenues of these accounts. Has this district ever used either of these mechanisms to acquire a vehicle?

***(Note:** Depending on the answer, probe to better understand the following: Do the respondents consider these to be really viable options; if these mechanisms have never been considered, why not; if these mechanisms have been used, has the experience been satisfactory? What problems have been encountered?)*

CBOH vehicle purchase facility used Yes [ ] No [ ]

Investment account purchase Yes [ ] No [ ]

IV. Indirect Effects on Contraceptive Logistics

***(Note:** Tell the respondents that at this point we would like to change the subject from logistics to Family Planning Services. Make sure that the interviewees include staff who provide services.)*

C401 How has the Health Reform program affected the delivery of family planning services? What benefits or problems has it brought?

> ***(Note:** There are many possible answers to this question, but four developments are possible topics: One is the increase in the method mix from two to 12 products; another is the integration of reproductive health and family planning services; another is that intended training for family planning service providers generally has not taken place; and a fourth is any reductions or transfers of staff that might be associated with the reforms.)*

C402 Has the range of family planning services changed? [ ] Yes [ ] No

If "Yes," how has it changed?

> *(**Note:** This question concerns a topic that may be covered in responses to the first question.)*

C403 Have the responsibilities of Family Planning services staff changed?

> *(**Note:** This question also concerns a topic that may be covered by the first question. A possible topic for discussion would be changes in work loads.)*

C404 In your opinion, have there been any changes in numbers of family planning clients since the health reform program began? If the answer is "Yes," what factors explain this?

*(**Note:** Confirming the validity of respondents' impressions is beyond the scope of this study. At this point, we are interested in hearing their opinions. If they do feel changes in numbers of acceptors has occurred, ask them how they know this or what information do they base their impressions on?)*

TAB

C405 If the data are available, record for the years 1997 and 1998 the numbers of family planning *New Acceptors* and *Revisits,* by month. Annotate this data to explain what health facilities it represents and how it has been aggregated.

***(Note:** These data are not being collected for purposes of tracking long term trends; rather, they are being collected to compare short term trends around known events in 1997 and 1998, such as "delinkage" and depletion of drug stocks at EDMSS.)*

1997

Month	New Acceptors	Revisits
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

1998

Month	New Acceptors	Revisits
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

Appendix D.
Summary of Health Sector Reforms, by Country

Health sector reform is not a new phenomenon. The four sub-Saharan African countries on which this study concentrates have been working to strengthen quality of health services, and improve efficiency and equity, through a variety of interventions in the health sector over the course of many years. For the purpose of this analysis, the authors have chosen to divide developments in the health sector into two periods (figure D-1).

The first period, "Incremental Change" is characterized by (1) efforts to decentralize, typically by devolving some decision making to health management teams at the district level, and (2) through cost recovery, typically by introducing user fees or fees for drugs. In general, these interventions have not been closely coordinated. The duration of this period of slow, incremental change as defined in this study varies from as little as 2 years in the case of Zambia to 17 years in the case of Ghana.

The second period, "Intensive Health Sector Reform," is characterized by much greater concern with health system efficiency and the introduction of a broader range of somewhat more coordinated interventions aimed at reforming the entire sector. As decentralization and cost-recovery efforts continue and expand, activities aimed at integrating health interventions that had been administered separately become important. An example is the integration of vertically managed health interventions, such as malaria control, nutrition, acute respiratory infection, immunization and control of diarrhea into a health service package—for example, integrated management of childhood illnesses. In addition, three countries in the study have begun to integrate their supplies systems and other management structures. During this period, "reform objectives" become an aspect of medium- and long-term health strategies published by ministries of health.

Figure D-1.
Timeline of Health Sector Reform, by Country

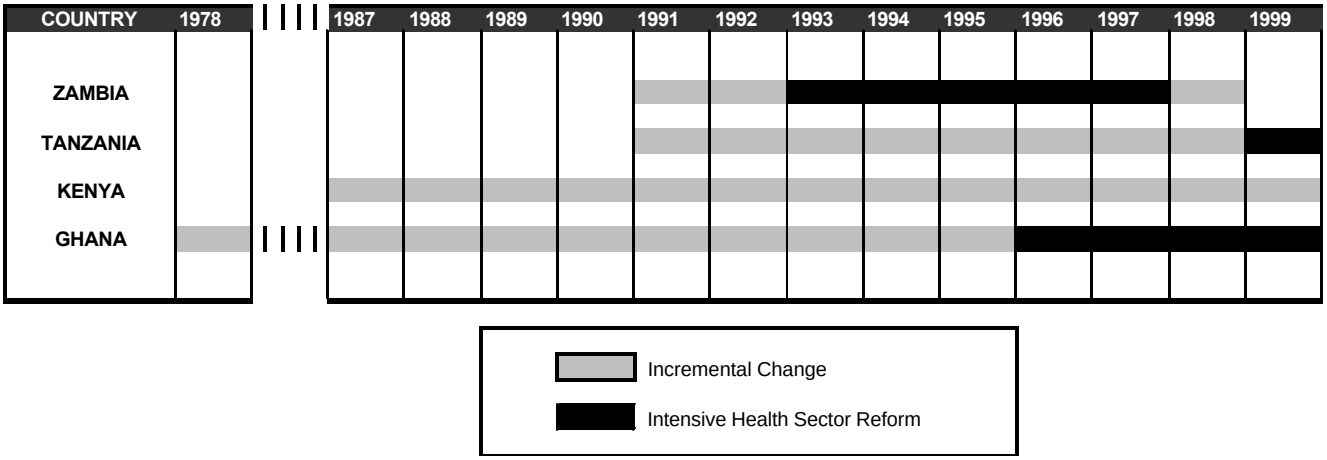


Table D-1. Selected Aspects of Health Sector Reform, by Country

Health Sector Reform	Ghana	Kenya	Tanzania	Zambia
Incremental Change	**1978–1995**	**1987–2000**	**1991–1998**	**1991–1992**
Essential Services Package				
Essential Drugs List	1988: MOH adopts EDL; reviewed and updated every 2 years	1990: EDL established; last update, June 2000		
Standard Treatment Guidelines		1994–Present: Standard treatment guidelines established	1998: Guidelines developed	
Essential Package Strategy		1999: Essential package strategy outlined	1996: Essential health package piloted	
Integration				
Structural integration of supplies system		1996: Formation of task forces on restructuring supplies system 1998: Study on restructuring the Medical Supplies Coordinating Unit 1998: Establishment of steering committees for the Kenya Medical Supplies Association (KEMSA) (KEMSA "gazetted" in 2000)	1998–present: Integration of medical supplies systems to the district level (completed in 1999)	
Health services integration			Integrated supervision quality improvement guidelines developed	

Health Sector Reform	Ghana	Kenya	Tanzania	Zambia
Incremental Change	**1978–1995**	**1987–2000**	**1991–1998**	**1991–1992**
Decentralization				
Health management teams	1978–present: DHMTs in operation	1987–present: District Health Management Boards in operation 1987–present: Hospital Management Boards functioning	1991–present: DHMTs in operation 1996–1999: DHBs in operation	1993–present: DHMTs in operation
Capacity building activities	1988–1992: Strengthening District Health Systems Initiative implemented		1997–1998: Health management training modules developed	1993–1998: Capacity building for DHMTs and health directors 1993–1998: Administrative systems developed

Health Sector Reform	Ghana	Kenya	Tanzania	Zambia
Incremental Change	**1978–1995**	**1987–2000**	**1991–1998**	**1991–1992**
Cost Recovery				
User fees	1985: User fees established to capture 15% of operating costs	1989–1990: Outpatient fees (short-lived, ended quickly) 1992–present: Outpatient fees renewed 1993–present: Systematic fee and exemption adjustments 1993–1994: Efforts to improve accountability 1999–present: New efforts to improve accountability 2000: Cash registers introduced at referral hospitals	1996–present: Community Health Fund in operation	
Insurance schemes		National Hospital Insurance Fund	1995–present: National Health Insurance	
Fees for drugs	1989–1993: Bamako Initiative pilot tests 1997: Cash and carry system established to capture 100% of drug costs	1996: Cash and carry system proposed, not yet implemented	1997–1999: Drug capitalization scheme for hospitals developed	
Fees for contraceptives	1988: MOH establishes prices for contraceptives			

Health Sector Reform	Ghana	Kenya	Tanzania	Zambia
Incremental Change	**1978–1995**	**1987–2000**	**1991–1998**	**1991–1992**
Privatization				
Health services policy			1997: Establishment of guidelines and registration of private-sector facilities	

Health Sector Reform	Ghana	Kenya	Tanzania	Zambia
Intensive Health Sector Reform	**1995–Present**		**1999–Present**	**1993–1997**
Essential Services Package				
Essential drugs list				1997: EDL updated
Standard treatment guidelines			1998–present: Guidelines in place since 1998	1997: Guidelines for health workers and curriculum development
Essential package strategy	1995–1997: Medium Term Health Strategy developed; identifies priority interventions		1999: Essential health package costing study	
Integration				
Structural integration of supplies systems			1998–present: Integration of storage and distribution for medical supplies systems to the district level	1997–present: Design and implementation of integrated supply management system
Health services integration				

Health Sector Reform	Ghana	Kenya	Tanzania	Zambia
Intensive Health Sector Reform	**1995–Present**		**1999–Present**	**1993–1997**
Decentralization				
Health management teams	1978–present: District Health Management Teams in operation 1998–present: Budget Management Centers (region, district) in operation		1991–present: DHMTs in operation	1993–present: DHMTs in operation 1995–1998: Neighborhood Health Committees established 1997–1998: Regional Health Directorates established
Capacity building activities				1993–1998: Capacity building for DHMTs and health directors 1993–1998: Administrative systems developed

Health Sector Reform	Ghana	Kenya	Tanzania	Zambia
Intensive Health Sector Reform	**1995–Present**		**1999–Present**	**1993–1997**
Cost recovery				
User fees	User fees continued from 1985		1996–present: Community Health Fund in operation	1992–1994: Gradual introduction of fees for outpatient services. MOH restructured to recast the ministry as the financing and policy branch and the CBOH as the services provider for the GRZ
Fees for drugs	Cash and carry system for drugs continued		1999–present: Pilot test of indent system for cost recovery in one region	
Fees for contraceptives	1999 and 1996: MOH-established prices for contraceptives increased			
Insurance schemes			1995–present: National Health Insurance in operation	
Block grants			2000–2002: District block grants introduced in phases nationwide	

Health Sector Reform	Ghana	Kenya	Tanzania	Zambia
Intensive Health Sector Reform	**1995–Present**		**1999–Present**	**1993–1997**
Privatization				
Health services policy			1991: Private practice legalized 1997: Guidelines and registration of private-sector facilities established	
Outsourcing				1998: Contractor engaged to handle medical supplies logistics; short-lived

Appendix E.
Summary of Variables for Ghana

Function	Association
Product availability at SDPs	Contraceptive availability especially for the three most frequently demanded products—Lo-Femenal, condoms, and Depo-Provera®—appears to have improved during the period corresponding to the reforms. In 1993, the percentage of SDPs stocked out of combined oral pills, condoms, and Depo-Provera® were 9%, 10%, and 7%, respectively. At the time of the study, no sites were experiencing, stockouts of Lo-Femenal or Depo-Provera®, and 9.5% were stocked out of condoms.* Drug availability, although not assessed by our study, also appears to have improved during the HSR period. Drug availability results from two separate studies, using different methodologies and samples, showed an improvement at public health facilities from 60% availability of 21 tracer drugs in 1993 to 83% availability of 30 tracer drugs in 1998.†
LMIS	Contraceptives are managed through a vertical LMIS that collects key logistics data from SDP levels and aggregates data at district, regional, and central levels through the flow of regular reports. HSR-related changes have not affected the timely and complete submission of contraceptive LMIS reports from SDPs, and reporting levels remain high, with over 90% of SDPs submitting regular reports to districts. One aim of HSR in Ghana is to integrate management of all logistics functions at the central level under the Procurement Unit, which heretofore was primarily responsible for drugs and consumables. The FH Unit (in charge of family planning services) has advocated for continuing vertical contraceptive LMIS as well as training Procurement Unit personnel in its use as a prerequisite to the integration of contraceptive logistics management into essential drugs logistics management. The lack of familiarity by the Procurement Unit with any LMIS, and especially with the contraceptive LMIS, has likely contributed to contraceptive logistics remaining largely vertical despite intentions to integrate. There is no LMIS for essential drugs. However, a computerized drug inventory system exists at the central warehouse and is perceived by essential drug managers to be an LMIS. Unlike the contraceptive LMIS, the drug inventory system cannot track stock movements or consumption at lower levels and is only used to generate biweekly reports of central-level stock levels and projected drug needs. Although contraceptives are included in this inventory system, they do not appear on the situation reports.

* Ghana Statistical Service 1994.

† Rankin et. al. 1993.

Function	Association
Product selection	Ghana's national EDL includes generic versions of injectables, implants and combined oral pills, which together account for over 50% of the resupply method mix in the country. None of the other contraceptives used in the country are on the EDL, however. The contraceptive method mix has remained fundamentally unchanged, although nonproject assistance was used as an incentive to increase use of long-term methods. Between 1995 and 1998, the percentage of total CYPs provided by long-term methods increased from 44% to 61%. Multiple brands have not formally been streamlined but, in the 1998 forecast, the FH Unit only procured one brand of combined oral pills and low-dose pills in an attempt to reduce overstocks of the commodities at lower levels. Ghana established its national essential drugs list in 1988, and it has since been revised on a regular basis. All procurement by the CMS, which procures the majority of drugs for the country's public health system, is limited to products on the EDL. However, procurement at district levels, which accounts for as much as 30% of district needs, are often from private vendors and are not necessarily limited to products on the EDL.
Financing	Contraceptive financing remained 100% donor-supported throughout the HSR period, with funding sufficient to cover Ghana's needs. USAID was the largest donor, followed by DFID during the HSR period. UNFPA contributed substantially in the past. Regular formal meetings to coordinate future plans for contraceptive financing needs among donors do not take place. DFID has not committed future funds and there is uncertainty about who will make up the shortfall if DFID decides to withdraw as a contraceptive donor. Usually, decisions about which donors will provide funding are made annually at the time of forecasting, and there is no long-term strategy for coordinating future needs and contraceptive financing among donors. MOH has no line item in its budget for drugs, and its drug supply is supposed to be fully financed by cost recovery through the cash-and-carry system except for funds provided by MOH for reimbursing exemptions. The cash-and-carry system does not recover all costs because credit is widely extended to hospitals and districts, and lower levels are not fully reimbursed for exemptions. The revolving drug fund, decapitalized twice during the HSR period, has been recapitalized in both cases using World Bank credits. Decapitalization continues to be a threat given current CMS practices, and sustainability is dependent on World Bank credits to maintain the revolving drug fund. Ghana's HSR program includes a SWAp among donors; all contribute to pooled basket funding at the central level. The basket funds are managed at the central level, and no block grants go to districts. Districts get an account code for the basket, against which they are supposed to charge certain activities or expenses, but they do not receive money from the basket separate from MOH funds.

Function	Association
Forecasting	Forecasting for contraceptives is based on dispensed-to-user data received through the vertical contraceptive LMIS and demographic data. Forecasts are conducted annually and estimate the country's needs for 1 year beyond the procurement planning period. The FH Unit still relies on technical assistance to complete the annual forecasts. No forecasts are conducted for drug needs. At the time of procurement, estimates are made only for the immediate procurement schedule; no forecasts for future needs are carried out.
Purchasing	Contraceptive quantification, carried out by the FH Unit with some external technical assistance, is based on dispensed-to-user data from the vertical LMIS. The procurement schedule is developed by the FH Unit together with donors. Contraceptives are purchased by the donors providing the commodities; UNFPA is the purchasing agent for DFID. USAID uses commercial freight forwarders for contraceptive purchases rather than the Ghana Supply Commission, MOH's procurement agent, thereby increasing the timeliness of purchases. The Procurement Unit, as part of HSR, is supposed to coordinate procurement of contraceptives, but this has yet to occur. Quantification of drugs at the central level is based on issues to the RMS by the CMS, not necessarily a good indicator of needs given that districts purchase at least 30% of their drugs on the open market. Quantification is assisted by external technical assistance to SSDM and GNDP. Increasingly, decentralization has resulted in the creation of District Procurement/Purchasing Committees that quantify local-level needs. Currently, CMS manages purchases using international competitive procurements. To improve drug procurement under HSR, MOH established a new Procurement Unit (responsible for drugs and consumables) and embodied new procurement procedures in a manual that has been disseminated through nationwide training since 1998. Central-level drug procurement capacity is still being developed with technical assistance from SNV (Netherlands Development Organization), and there is still a need to develop capacity at lower levels. At the time of the study, less than one-third of public-sector facilities had procurement or purchasing committees.

Function	Association
Storage and Inventory Management	The central level provides one-stop shopping to clients, with contraceptives and essential drugs stored in different bays on the CMS grounds in Tema. Before collecting contraceptives, however, clients must have LMIS reports approved by the FH Unit in Accra. Quality of storage at the central level for contraceptives and essential drugs is satisfactory. There is little integrated storage of contraceptives and essential drugs at regional, district, and SDP levels. In some regions, contraceptives and drugs are stored several miles apart; in others, drugs, contraceptives and consumables are stored in different locations within the RMS. The 5 districts in the study sample store drugs in the pharmacy of the district hospital. Contraceptives are in a separate storeroom at the hospital or at the DHMT offices located away from the hospital. At the majority of the 16 SDPs, drugs and contraceptives are stored separately in different drawers or cupboards and, on rare occasions, in the same room. In all cases, they are managed by different people. In general, SDPs do not have dedicated storage areas for all commodities. No districts scored above 70% on the storage assessment although quality of storage at SDP levels was deemed satisfactory at the majority of sites. This discrepancy is likely due to the small amounts of product that SDPs manage compared to districts. Contraceptive storage receives less qualified attention than essential drugs, perhaps because of the need for more accountability for the latter. In general, at all 24 sites at regional, district, and SDP levels, contraceptives are stored under less optimal conditions than essential drugs, with poor performance in managing min/max inventory levels, stock record-keeping and maintaining cleanliness standards. In only 5 of 15 cases at district stores and in only 15 of 48 cases at SDPs were the 3 indicator contraceptives stocked between their min/max levels.

Function	Association
Transport	MOH's fleet of functional vehicles is insufficient to ensure transportation throughout the system. Regions have to pay for deliveries from CMS, and districts have to pay for deliveries using RMS vehicles. This situation encourages procurement from private wholesalers who deliver products at no charge. Transportation of contraceptives and drugs is not systematic or regular but relies on the initiative and availability of resources of program managers at regional levels. The same vehicle may be used for transporting essential drugs and contraceptives, but the two commodities are rarely delivered at the same time or use the same source of funds for fuel. At all levels, contraceptives, drugs, and vaccines are all collected separately by the staff who manage them. All 5 districts had at least 1 operational vehicle and 1 or more motorcycles. The vehicles did not appear to be used systematically for transporting commodities, however, and were mainly for the administrative and supervisory use of DHMT members. Inadequacy of transport resources was one of the most common complaints at districts and SDPs. However, in districts with 2 operational vehicles, the problem may be related to ineffective management of transportation resources rather than insufficient resources. SDPs use funds from the sale of contraceptives to ensure the regular collection of supplies from districts by hiring private vehicles or using public transport. Commodities are rarely delivered to SDPs using district vehicles. Service providers responsible for drugs at SDPs also use public transport to collect commodities but contraceptives and drugs are rarely collected at the same time.

Function	Association
Human resources	The implementation of Ghana Health Services, an element of civil service reform, was delayed by several years until 2000 because of anxiety about employment security of civil servants. The majority of health care personnel will no longer be employed by the MOH but by GHS, which will be headed by a director who reports directly to the Minister of Health. All 5 district facilities and 15 out of 16 SDPs had at least one staff member trained in contraceptive logistics. However, this training was not always competency-based, and providers were frequently unable to remember being trained when first asked. Although there appear to be more frequent in-service training opportunities in particular management and financial training for DHMT members (because regions and districts now determine their own training needs) there is pronounced regional variation in the quantity and quality of training. Furthermore, there is no requirement to include contraceptive logistics in the training plan. In 1998, only 4 of 10 regions offered family planning logistics management training. Training is not always provided to appropriate individuals, and scarce resources mean that training is not always provided by qualified trainers. Poor execution of storage, inventory management, and record-keeping tasks at districts and SDPs suggest that training does not always result in effective skills-transfer. Funds generated from the sale of contraceptives are often used to increase in-service training opportunities, with “orientations” held in family planning logistics. However, the noncompetency-based nature of the orientation means that there is little transfer of logistics skills. There is more frequent supervision between districts and SDPs. Only 2 of 16 sites had not received a supervisory visit within the previous 6 months. However, supervision is not necessarily focused on contraceptive logistics, as demonstrated by the poor performance of a list of logistics functions. Supervision is conducted by rotating DHMT members, and because some do not have family planning or contraceptive logistics management background, monitoring of logistics functions is not systematic. A training of trainers workshop in drug procurement procedures for national and regional level trainers occurred in 1998-1999, with 800 procurement officers slated for training. The need for effective training in drug procurement at district levels is demonstrated by the following situations: the vast majority of public facilities had no procurement plans or budgets, few facilities have established reorder stock levels for drug items, and most providers responsible for drugs are not familiar with the concept of reorder levels.

Appendix F.
Summary of Variables for Kenya

Function	Association
Product availability at SDPs	In 1989 and 1998, stockouts at the district-level stores for the three most used contraceptive products (Depo-Provera®, low-dose orals, and condoms) plunged from almost 35% to around 5%. This change in performance corresponds roughly to the expansion of logistics management systems developed between 1985 and 1988 through short-term technical assistance and the installation of an automated commodity-tracking mechanism, the CCMIS, at the DPHC. In 1991, stockout rates climbed back up to 15% but by 1992, were back down around 5%, where they remain to this day. Maintenance of this performance may be due, in part, to important program interventions such as the placement of a long-term technical advisor (1991–2000) and implementation of the automated Distribution Resource Planning module (1993–2000). Contraceptive availability at SDPs has correspondingly tended to improve between 1989 and 1995. In 1996, Miller, et al. noted an increase in availability of Depo-Provera® and a consistently high availability of pills and condoms. The only substantial decrease was in the availability of vaginal foaming tablets, for which Kenya had no international donor supply. No data on availability of drugs at the SDP level were located for comparison at the time of our study. Due to the MOH and donor satisfaction with the contraceptive distribution system, STD drug kits were added in 1995.
LMIS	The ability to provide logistics information routinely for contraceptives and STI drugs has made Kenya's MOH/DPHC a model for commodities management within the country. Clearly a high-profile intervention, the LMIS has increased the capacity of the MOH to account for donor's contraceptive inputs. The automated component of the contraceptive LMIS was programmed on a Clarion database by Kenyan staff, and the high degree of local ownership of this system has contributed to its acceptability and success. Of the 6 donor representatives interviewed in this study, 5 were very satisfied with the contraceptive logistics system, citing it as an excellent management model. They all appreciated the regularity with which the SDPs were providing feedback to the district level and the continuity of supply.
Product selection	Clinical guidelines published in 1994 cross-reference generic and brand-name drugs. This would seem to indicate no preference for generics. Contraceptive procurement is largely through bilateral funds. Thus, the GOK has little control over the brand of contraceptive received. Donor commitment to coordination on contraceptive procurement has kept brand substitutions to a minimum.

Function	Association
Financing	The per capita national recurrent cost budget of the MOH has declined in value over the past 10 years. Contraceptive financing remains bilateral. Health sector financing in Kenya comes from four main sources: GOK funds, either government revenue or loans; donor "project" funds; cost-sharing funds (from clients); and the National Hospital Insurance Fund (NHIF) for support in catastrophic illness. FPLM has long played a role in assisting the MOH to coordinate donor inputs. Working within the LMU, FPLM assumed an important role by assuring that distribution data were updated, analyzed, and disseminated to the donors. Processing distribution information is critical to the donors who are increasingly required to account for their inputs and how they are used to benefit the recipient country. In turn, long-term planning for contraceptive requirements has helped the MOH to negotiate the necessary donor commitments in advance. Following a DANIDA-funded assessment of the central medical stores system, an implementation plan was developed. It laid out the necessary resource requirements for upgrading the functionality of the Medical Supplies Coordinating Unit (MSCU), and proposed changing the institution's management and financing practices. FPLM and MSCU managers were then able to advocate for the changes as well as identify sources of funding. Over time, commitments were secured for portions of the plan, and some pieces (e.g., the development of a business plan) progressed; others, such as automation of the LMIS, did not. The 1997 proposal suggests establishing user fees for contraceptives and STI drugs. There is an increasing emphasis on the importance of cost-sharing for financing health services. While the structure of fees and exemptions are yet to be developed for contraceptives and STI drugs and the accounting mechanisms are not in place, a cost-recovery scheme may, in fact, be more responsive to client demand and supply a much needed source of revenue for health commodities. In 1998, Kenya's donor community signed a brief "Statement of Intent," committing to coordination of resources. The GOK gazetted the Kenya Medical Supplies Association (KEMSA) in 2000, effectively committing to the reorganization of the MSCU. The 1998 Statement of Intent should serve as a point of departure for negotiating the necessary resources and inputs over time for the process to which the GOK has committed. FPLM has consistently advocated that donors consider the cost of delivering commodities to the client as opposed to the cost of deliveries simply to the port, suggesting that, based on industry standards, 15% of commodity cost is a reasonable estimate of logistics costs within Kenya.

Function	Association
Forecasting	In addition to providing information collected and processed through its LMIS, FPLM created a forum (the periodic Logistics Coordination Meetings) for donors where they can discuss practical issues related to contraceptive supplies. Two donor representatives interviewed during the study made a point of mentioning that contraceptive prevalence was one of the few health indicators that had continued to improve between the last two demographic health surveys; they linked this improvement to the continuity of contraceptive supply.
Purchasing	Contraceptive procurement remains largely donor-controlled and is done with sufficient frequency and accuracy to assure contraceptive availability. Due to “good governance” questions, it is unlikely that the GOK will have regular responsibility for procuring contraceptives in the near future. Fear of corruption has led some donors and collaborating agencies to steer clear of procurement reform altogether.
Storage and Inventory Management	Integrated storage of drugs, contraceptives, lab supplies, and expendable medical supplies from all vertical programs is planned as part of the restructuring of the central medical stores. It is not yet functioning. FPLM efforts to provide competency-based logistics management training to stores managers, assuring that performance guidelines for logistics were established and the necessary personnel trained, particularly at the district level, has contributed to the effectiveness of the logistics system. FPLM has since adopted an on-the-job training strategy to keep logistics personnel up-to-date. Training and supervision by MOH staff supported by FPLM have played a role in decreasing contraceptive stockouts.

Function	Association
Transport	Efforts were made to carefully control the vehicle fleet that delivers contraceptive commodities from the central to the district levels. Many of the vehicles are more than 7 years old and have clocked over 250,000 km, but continue to function due to careful maintenance and increased accountability for vehicle use. FPLM has been analyzing vehicle repair and maintenance records to determine the point at which it is more cost-effective to replace a vehicle than repair it. This is consistent with the project philosophy that operational decisions should be based on data as far as practicable. Contraceptive transportation is managed using the Distribution Resource Planning (DRP) module of the LMIS. This helps managers determine (1) the date of delivery that will prevent stores from falling below a 3-month minimum stock level for critical commodities, (2) the appropriate size of vehicles in the fleet to maximize capacity, (3) the most efficient routing; and (4) the packing list. The DRP is highly valued by the MOH and will likely be adapted for more general use by the central medical stores if plans go forward. Survey respondents to our study indicated that the kit system used for drugs has led to stock imbalances. These imbalances are sometimes corrected during supervision visits by transferring overstocked products from one SDP to understocked SDPs. It is not a particularly efficient method of distribution. Information about the current status of integrating transport at the districts and SDPs did not provide enough information for the study team to form a conclusion.
Human Resources	At the highest levels of the MOH, new personnel are considered reform-minded and capable of leading efforts to reform management of the health sector. In the contraceptive distribution program, clear job descriptions and enhanced job responsibilities for drivers fostered a sense of responsibility and teamwork within the organization and reduced driver downtime during delivery of contraceptives. LMU and MOH staff visits supported by the MOH and FPLM assure that (1) supervision takes place, and (2) there is a focus on contraceptive logistics. Much emphasis had been placed on training of personnel. However, staff turnover at the district level in Kenya is so rapid that the original training strategy was too costly to sustain. Alternative in-service training strategies have been developed for the personnel involved in contraceptive logistics.

Appendix G.
Summary of Variables for Tanzania

Function	Association
Product availability at SDPs	Contraceptive availability for the three most frequently demanded products—combined oral pills, injectables, and condoms—appears to have improved at health facilities during the reform period. In 1996, 26.9% of health facilities were stocked out of the three products, compared to 11.3% in 1999.[‡] At the time of the study visit, none of the 23 SDPs in the sample suffered stockouts of Depo-Provera®, and less than 10% of sites experienced stockouts of condoms and pills. Drug availability through the kit system continues to ensure that facilities have a regular supply of commodities although there are often stock imbalances caused by surpluses of less popular drugs and stockouts of drugs in high demand. Between 20%-35% of the 23 SDPs experienced stockouts of the three indicator drugs—aspirin, chloroquine and amenophylline—at the time of the study visit.
LMIS	In theory, a vertical LMIS has been designed and exists for each commodity type. However, after implementation of the national, integrated HMIS, the essential drugs LMIS has been almost completely discontinued. Although the HMIS is supposed to replace the drug LMIS, stockout and overstock information is no longer collected for all products, nor are any data used at district or SDP levels to correct stock imbalances. The capitalization system at hospitals has a well-functioning LMIS that collects and aggregates consumption and sales data, which are sent up to the central level. However, resupply for district hospitals is more dependent on available funding than dispensed-to-user data. The HMIS has also compromised performance of the vaccine LMIS by eliminating a form (MCH3) that sent logistics data from SDPs to districts. Because the data now have to be collected by a supervisor, logistics data are not systematically used for resupply decision making. Continued use of the vertical contraceptive LMIS has been maintained as a result of advocacy and support by the Reproductive and Child Health Section (RCHS). The contraceptive LMIS continues to function well but can be improved if SDP personnel systematically receive training in completing R&R reports
Product selection	No contraceptives are included on the EDL despite RCHS efforts to have them added. Multiple brands of certain contraceptive methods, such as pills and condoms, are available, but RCHS is active in coordinating which donors supply which contraceptives, basing decisions on consumption-based forecasts. Tanzania has a national EDL, and MSD procures all essential drugs from the essential drugs list.

[‡] Macro International, 1999.

Function	Association
Financing	Contraceptives are 100% financed by donors (primarily USAID, DFID, UNFPA, and KfW) and cover all Tanzania's needs. Donor coordination for contraceptive provision appears to be well managed by the RCHS, although there are no formalized and regular meetings for this purpose. Decision making in the donor-coordination process is based on consumption-based contraceptive forecasts. MOH funds between 50-60% of drugs with donors providing funding for the remaining supply. Some cost-recovery initiatives at lower levels are being initiated, primarily through the capitalization system at district and other hospitals. Hospitals have established revolving drug funds and recover 50% of drug costs by charging almost all clients (exempted patients get free drugs). The proceeds are used at the local level for purchases on the open market, and none of the revenues are sent to the central level or used to purchase supplies from MSD. There is no cost recovery of any commodity at health centers and dispensaries. Contraceptives and vaccines are still provided at no cost to clients, even at hospitals. There is no formal mechanism for coordinating drug financing among MOH and its partners. As part of local government reform, new financing mechanisms include block grants to districts. Tanzania is implementing block grants in phases over 3 years: to 37 districts in 2000; to another 45 districts in 2001; and to 33 in 2002. There are 3 types of block grants: (1) nonconditional grants that give districts flexibility in use of funds; (2) conditional grants earmarked for spending in specific sectors; and (3) equalization grants targeted for specific, underprivileged districts. Block grants for the first 37 districts began August 15, 2000, and are distributed quarterly. The remaining districts that are not receiving grants until 2001 and 2002 are still being funded under Health Sector Program support, which does not really empower districts to manage or allocate own funds, but instead centrally manages funds for them. Block grant funding is a combination of basket funding and contributions from local governments (the contribution by local government varies by district). Donors contributing to the basket fund include: DFID, DANIDA, the Norwegian Agency for Development Cooperation (NORAD), Swiss Development Corp., DGIS and Irish Aid.
Forecasting	The logistics unit at the RCHS conducts biannual contraceptive forecasts using PipeLine software. Forecasts are based on dispensed to user data received through the vertical contraceptive LMIS and demographic data, and needs are projected for a year beyond the procurement schedule. Forecasts are not conducted for essential drugs. Estimates are made for the 18-month procurement schedule but not beyond.

Function	Association
Purchasing	Contraceptive quantification is done by the RCHS logistics unit using dispensed-to-user data received through the vertical LMIS. The procurement schedule is developed by the unit together with the relevant donors, and the supplies are purchased by the donors that provide each commodity. MSD quantifies its drug needs using a combination of data sources, basing calculations on the content of the kits and the number of SDPs slated to receive kits. Drugs for use at the hospitals are quantified using sales data. MSD purchases most essential drugs and some vaccines. MSD purchases bulk shipments of drugs through international competitive procurement mechanisms. Other drugs are provided by DANIDA in the form of prepackaged kits.
Storage and Inventory Management	Contraceptives, essential drugs, consumables, and vaccines are stored together at the central level MSD store. MSD has created 7 zones from the 20 regions that serve as intermediate storage points between central and district levels.§ Storage at district and SDP levels is less likely to be integrated. At district levels, commodities are rarely stored in the same room because of space limitations, and they are always managed separately. At SDPs, storage location is dependent on the person managing the product or on available space. No SDPs in the sample had a dedicated storage area for all commodities. Storage conditions at the central level were satisfactory. However, quality of storage for all commodities was unsatisfactory at both district and SDP levels, with no sites receiving a score of 70% in the assessment. Storage for contraceptives and vaccines fared slightly better than other product categories. Inventory management of contraceptives was poorly executed, with 30% or fewer SDPs stocking the 3 indicator contraceptives between their established minimum and maximum levels.

§ All commodities are also stored together at zonal stores, with the exception of some vaccines stored at regional vaccine stores.

Function	Association
Transport	Under the contract with MOH, MSD is responsible for distributing all essential drugs and contraceptives and most vaccines from the central to the district levels. In areas where regional vaccine stores (RVS) still exist, vaccines are delivered to districts by regions rather than by MSD. As part of the outsourcing contract, the MOH and donors pay MSD for storage and distribution costs from central to district levels based on a fixed fee per cubic unit for drugs, contraceptives, and vaccines. MOH pays for drug costs, USAID and UNFPA for contraceptive costs, and DANIDA for vaccine costs. In general, MSD delivers all commodities to districts at the same time and is able to do so on a regular basis. Transportation management is being decentralized. The centralized system that was established and has operated until now is being transferred over to the regional administration for local governments. All vehicles are now provided to districts under HSR (each district has two vehicles) are less than two years old and replacement funds for the vehicles are being established. The guideline is that U.S.$0.04 per kilometer per year per vehicle be set aside from the basket funds as a depreciation fund for replacing vehicles. Each of the 6 districts has 2 operational vehicles provided under HSR: a single cab for distribution and a double cab for supervision. Transportation within the district is strictly regulated by a matrix that determines delivery and supervision schedules and ensures that once a product reaches the district, it is generally delivered to SDPs in a timely fashion. Essential drugs, contraceptives, and vaccines are usually delivered to SDPs together as per the matrix. However when delivery of essential drug kits is delayed, contraceptives and vaccines are delivered according to schedule, and kits are delivered to SDPs later. None of the 6 district hospitals had a vehicle. Because they are not included in the transportation matrix, they have to incur fuel and per diem costs for vehicles that they use to collect drugs from MSD. The capitalization system originally built transportation costs into the 112% markup that hospitals were allowed to charge clients, but for political reasons the fee was reduced to 50% of drug costs. Although district hospitals get their drug supply separately from the district supply, contraceptives and vaccines for district hospitals are delivered together with those for other SDPs in the district. District Councils are increasingly involved in providing funds for fuel in the event of shortages in the DHMT operating expense budget, which is in keeping with the increased emphasis on local government under civil sector reforms.

Function	Association
Human Resources	Under civil sector reform, most SDP staff (especially at health centers and dispensaries) have shifted from serving as MOH employees to being employed by District Councils. Although there is some discontent, there now appears to be better stability and less mobility among staff. District program coordinators have received formal, competency-based logistics training specific to their programs. However, because of the separation of distribution and supervision functions under HSR, the contraceptive and vaccine logistics systems (originally designed as push systems) have become coexisting push and pull systems due to inconsistent use of logistics data in calculating resupply quantities. SDP staff have not been systematically trained in logistics, so there cannot be a complete transition towards pull systems for both commodities. Under HSR, supervision is conducted by a rotating team of DHMT members that does not necessarily include district coordinators trained in program-specific logistics. Though supervision occurs regularly between districts and SDPs (due to available and scheduled transportation resources), it is superficial in terms of reinforcing logistics performance. Each SDP had received a supervisory visit within the 3 months preceding the study team visit. To compensate for rotating supervision by non-trained logistics personnel, most DHMT members have been oriented in contraceptive logistics. However, supervisors do not pay attention to contraceptive logistics consistently and effectively, as demonstrated by poor performance at SDPs of logistics functions such as storage, stock record keeping, accuracy of reports, and inventory management. Implementation of the capitalization system was accompanied by training specific to operating the system. This is also true for the indent system in the one region where it is being piloted.

Appendix H.
Summary of Variables for Zambia

Function	Association
Product availability at SDPs	In a check carried out at 12 SDPs in 1999, the full method mix at SDPs was rarely found, but the most frequently demanded products–Noristerat, Microgynon and condoms–were widely available. A destination audit conducted in 1998 for 112 SDPs produced about the same result. A check for 12 indicator drugs for reproductive health carried out at 139 SDPs in 1999 found that, on average, 6 were out of stock.
LMIS	Despite difficulties, MOH was making some progress in implementing an LMIS. In February 1999, about 30 percent of facilities were reporting, and central level staff were organizing a database. Implementation of the HMIS effectively resulted in abandonment of LMIS reporting for contraceptives and other supplies, halting the gradual progress being made in data-based forecasting at the national level. It also eliminated each higher level's capacity to monitor stock positions at lower levels. There is no LMIS for essential drugs. However, an automated inventory control system exists at the central level. While fully functional, this system manages data only for stock received, stored, and issued at the central warehouse. It provides no information for lower levels of the system.
Product selection	All contraceptives used in the country appear on the EDL by generic name. A post-Cairo needs assessment for reproductive health services, which some system participants regard as integral to HSR, resulted in a revision of the contraceptive method mix and a significant reduction in the procurement of the numbers of brands procured for each generic contraceptive. All drugs procured by MOH at the central level are limited to products that appear on the country's national EDL.

Function	Association
Financing	Contraceptive financing remained bilateral throughout the intensive HSR period, with donors providing 100% of the supply. DFID has been the largest donor, followed by USAID. The DFID project ended in 1999, and DFID has paused to consider whether to fund a follow-on project because of "good governance questions" raised by the nontransparent selection process for the MSL contractor and some drug procurements. MOH and its partners meet twice annually to review progress on a comprehensive work plan. There is no dedicated forum for planning contraceptive needs and, with the LMIS broken down, there is no forecasting on consumption or issues data to serve as a basis for discussion of needs. Currently decisions about which donors will finance contraceptive purchases are made ad hoc, and there is no long term strategy for coordinating future needs and contraceptive financing among donors. MOH's drug supply is funded at least 4 ways: GRZ budget funds, World Bank Credits, MOH management of bilateral donor-financed procurements, and donor management of bilaterally funded procurements. At the national level there was marked fluctuation of drug financing in U.S.$ per capita from 1994–1998. The direct reasons were nonavailability of anticipated GRZ funds, resistance to conditionalities linked to expenditure of World Bank Credits, and withdrawal of bilateral funding by one donor dissatisfied with the procurement process for the MSL contractor. In 1999, GRZ financed about 33 percent of drug supply and donors financed about 66 percent. The per capita value of drug financing for 3 districts for which data could be compiled declined throughout the study period from U.S.$1.14 to U.S.$0.73. Values of drugs actually shipped to these districts in 1999 ranged from U.S.$0.24 to U.S.$0.37 per capita. Not all the specific reasons are known, but it is clear from both qualitative and qualitative evidence that drug stocks available for all clients of MSL declined dramatically from 1997–1999. MOH is reasonably effective with some aspects of donor coordination for drug financing. For example, staff are able to compare expected inputs from all sources and rationally adjust product selection and order quantities. The problems that exist have more to do with meeting donor conditions for competitive procurement than for coordinating financial inputs. Under decentralization, districts receive block grants through a basket funding arrangement to which MOH and other donors contribute. The grants cover nonpersonnel and nondrug operating costs. Drugs and other expendables are allocated to districts on a population basis. These supplies are not part of the grant but are provided from accounts at the central medical stores that are debited for the cost of supplies issued to each district. Because drugs are in such short supply, this system does not provide district decision makers with much choice in drug orders.

Function	Association
Forecasting	Forecasting for contraceptives is based on issues data from the central warehouse or MSL for both contraceptives and essential drugs. Due to changes in the contraceptive LMIS, gradual progress in forecasting based on district-level issues was reversed. The Contraceptive Logistics Unit does a good job of tracking issues from MSL and basing forecasts on this data, but this is at best a suboptimal method. Drug forecasting does not use consumption data or high-quality issues data to estimate future needs. Such data are not available.
Purchasing	Because of the demise of the contraceptive LMIS, contraceptive logistics staff base quantifications for purchases on stock on hand and issues at the central warehouse. DFID had originally planned, at the end of its first project, to pass management of contraceptive purchases to MOH in the follow-on project. Due to the “good governance” questions cited above, responsibility for purchasing will remain with DFID if a follow-on project is funded. For drug needs quantification, the data available are about the same as for contraceptives, i.e., stock on hand and issues at the central warehouse. Little is known about issues or consumption at lower levels. Therefore, drug purchases quantifications are based mostly on stock on hand data and perceived needs. MOH manages most drug purchases. Its record for efficiency is uneven; major disruptions were recently caused by nonavailability of anticipated MOH funds and MOH’s inability to manage an international competitive procurement process using World Bank credits. These two factors caused significant delays in procurement and contributed directly to nonavailability of essential drugs at districts and SDPs. Interestingly, MOH has generally been able to manage competitive procurements using bilateral funds.

Function	Association
Storage and Inventory Management	At MSL, integration of storage of drugs, contraceptives, lab supplies, and expendable medical supplies from all vertical programs has created one-stop shopping for customers at the central level. Vaccines are the only major group of commodities not integrated into the MSL. Contracting out management of MSL has resulted in general improvement in facility maintenance and security, and for receiving, issuing, and stock control at the central level. The MSL contractor is providing prefabricated warehouses to district level. The terms of the MOH contract with MSL are not known publicly. Donors have some concern that the terms are not financially advantageous to MOH. Thus, although the arrival of the contractor resulted in a significant reduction of non-essential staff, it is not clear if outsourcing central storage services has resulted in financial efficiency. For the study sample of 5 districts, storage is still not integrated at the district level. It is not clear how this situation affects the district health office's ability to make contraceptives, drugs, and other supplies available to customers. More concretely negative is the fact that a number of storage activities are poorly performed by district staff, including management of min/max levels, stock record keeping, and reporting of stock positions. For the 15 SDPs in the sample, storage is not generally integrated. Quality of storage apace was often unsatisfactory with only 68% of sites receiving a score indicating acceptable storage conditions. Inventory management at districts and SDPs was not well executed. In the 12 SDPs for which data were complete enough, the study checked the status of the highest demand contraceptives. There were 36 opportunities for products to be stocked according to the min/max plan. For this sample only 1 product at 1 site was stocked within the correct range.

Function	Association
Transport	The MSL contractor is responsible for periodic deliveries to districts and hospitals and has provided a fleet of new trucks. Thus, deliveries have become much more regular. All supplies issued from the central warehouse are transported to district levels monthly, including contraceptives and drugs. Vaccines are transported separately from their own central storage point. Contraceptives, drugs, and other supplies are transported together. Concerning the financial efficiency of this innovation, the same caveat noted for central storage applies to transport. Since we do not know the cost of this service, we cannot make comparisons with pre-outsourcing costs. Transport service between the center and districts is certainly more effective than before, however. While MSL staff stated that deliveries to districts were regular, some district staff disputed this assertion. It was not always clear, however, whether the complaints were about regularity of deliveries or insufficiency of the supplies delivered. All 5 districts in the sample had at least 2 operational motor vehicles. We do not have pre-reform information on this point. Compared with many countries, however, this is good performance, and some might argue that decentralization, with local budgetary control, combined with management training provided under HSR, have given district boards the means to keep their vehicles operational. As outside observers, the study team felt that transportation resources at district level were adequate for logistics purposes. However, inadequacy of transport resources was one of the most common complaints at district and SDP levels. One reason for this perception might be that transport is required for purposes other than logistics, including movement of patients. Inefficient management of available transportation resources is another possible reason. Transport from the districts to SDPs is fully integrated. For the study sample, district staff tended to describe deliveries of contraceptives, drugs, and vaccines to SDPs as regular, but some SDPs thought otherwise.

Function	Association
Human Resources	Under HSR, MOH announced in 1996 that most staff would cease to be civil servants and instead become employees of district and hospital boards. This caused considerable anxiety among those concerned. The plan was so politically sensitive that, in 1999, MOH put it on hold indefinitely. According to observers, the episode resulted in low morale and serious declines in productivity. Within the context of its capacity-building stream of activities, HSR has recognized the need for manuals and training to enable staff at districts and SDPs to carry out a range of logistics tasks. In every sample district, two staff members had received logistics training. A cascade training approach was used so that these staff trained SDP staff. However, there is no evidence that training was competency-based or that the necessary logistics skills were transferred in the process. Staff at the district level could describe how needs quantification should be done, but there is no evidence that they understood the steps involved well enough to carry them out or that the information required was really available to them. For staff at districts SDPs, training did not result in proper execution of such tasks as maintaining min/max levels, taking physical inventories, or using stock record cards. For all 5 districts and 15 SDPs, district and SDP staff agreed that supervision takes place regularly. The poor performance of various logistics tasks shows, however, that supervisors are not paying attention to logistics.

Appendix I.
Summary of Variables, by Country

Country	Ghana	Kenya	Tanzania	Zambia
HSR Period:				
Incremental	**1986–1996**	**1987–2000**	**1991–1998**	
Intensive	**1996–2000**		**1999–2001**	**1993–1998**
Study Date	**November 1999**	**April 2000**	**May 2000**	**August 1999**
Modern Method Prevalence				
• Before HSR*	4.4%	9.7%	5.6%	8.9%
• About time of study	12.9%	31.5%	15.3%	14.4%
Product Availability				
• Satisfactory supply levels of contraceptives at SDPs at the time of study	Y	Y	Y	Y
• Satisfactory supply levels of drugs at SDPs at the time of study	Y	ND	Y	N
LMIS				
• Contraceptive LMIS exists	Y	Y	Y	Y
• Drug LMIS exists	N	N	Y	N
• Contraceptive LMIS functions effectively	Y	Y	Y	N
• Drug LMIS functions effectively	NA	NA	N	NA
• Implementation of HMIS has negatively affected contraceptive LMIS	N	N	N	Y
• Implementation of HMIS has negatively affected drug and/or vaccine LMIS	NA	NA	Y	NA
Product Selection				
• Contraceptives appear on EDL	N	N	Y	Y
• Recent rationalization of contraceptive method mix	Y	Y	Y	Y
• Adherence to national essential drug lists for drug procurement	Y	Y	Y	Y

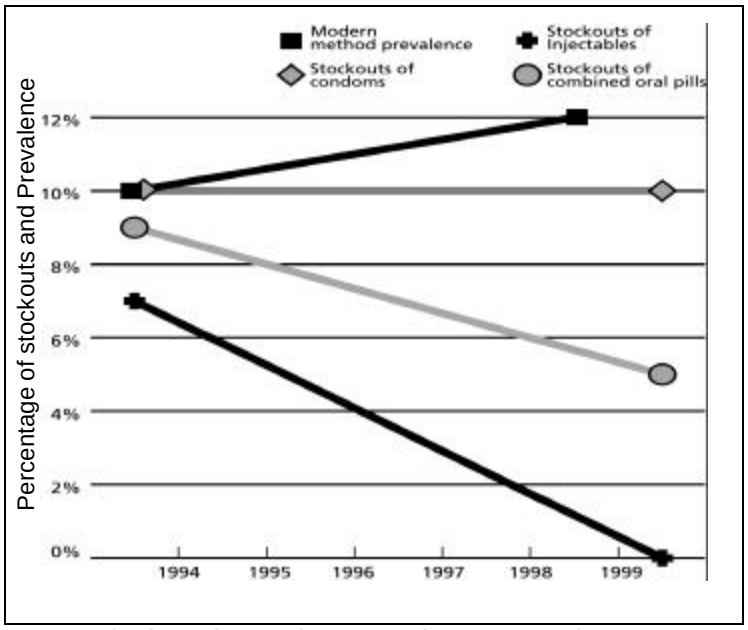
Country	Ghana	Kenya	Tanzania	Zambia
HSR Period:				
Incremental	**1986–1996**	**1987–2000**	**1991–1998**	
Intensive	**1996–2000**		**1999–2001**	**1993–1998**
Study Date	**November 1999**	**April 2000**	**May 2000**	**August 1999**
Financing				
• Sustainability of contraceptive financing	N	N	N	N
• Systematic coordination for contraceptive financing	N	Y	N	N
• Sustainability of drug financing	N	N	N	N
• Systematic coordination for drug financing	N	N	N	N
• Provision of basket funding or block grants for districts	N	N	N	Y
Forecasting				
• Forecasting for contraceptives carried out	Y	Y	Y	Y
• Forecasting for drugs carried out	N	N	N	N
Purchasing				
• Quantification of contraceptives based on consumption or issues data from the lowest level possible	Y	Y	Y	N
• Drug quantification based on consumption or issues data from the lowest level possible	N	N	Y	N
• Effective execution of contraceptive purchases	Y	Y	Y	Y
• Effective execution of drug purchases	Y	N	Y	N

Country	Ghana	Kenya	Tanzania	Zambia
HSR Period:				
Incremental	**1986–1996**	**1987–2000**	**1991–1998**	
Intensive	**1996–2000**		**1999–2001**	**1993–1998**
Study Date	**November 1999**	**April 2000**	**May 2000**	**August 1999**
Storage and Inventory Management				
• Integrated storage at central level	Y	N	Y	Y
• Satisfactory quality of stores management at central level	Y	N	Y	Y
• Integrated storage at district and SDP levels	N	N	N	N
• Satisfactory quality of stores management at district and SDP levels	N	Y	N	N
• Effective inventory management of contraceptives at SDPs	N	Y	N	N
Transport				
• Central to district resources adequate for contraceptives	N	Y	Y	Y
• Central to district resources adequate for drugs	N	N	Y	Y
• Central to district is integrated	N	N	Y	Y
• District to SDP level resources adequate for contraceptives	N	Y	Y	Y
• District to SDP resources adequate for drugs	N	Y	Y	Y
• District to SDP is integrated	N	N	Y	Y
Human Resources				
• HSR related change in employment status has affected MOH staff	Y	NA	Y	Y
• Logistics training has taken place	Y	Y	Y	Y
• Logistics functions covered by training carried out effectively	N	Y	N	N
• Supervision of SDPs takes place	Y	Y	Y	Y
• Supervision focuses on logistics	N	Y	N	N

ND = No data
NA = Not applicable
Source: US Bureau of the Census International Data Base. http://www.census.gov/ftp/pub/ipc/www/idbnew.html (July 12, 2000).

Appendix J.
Contraceptive Availability and CPR by Country

Figure J-1.
Ghana: Trends in Contraceptive Stockouts and Contraceptive Prevalence, 1993–1999



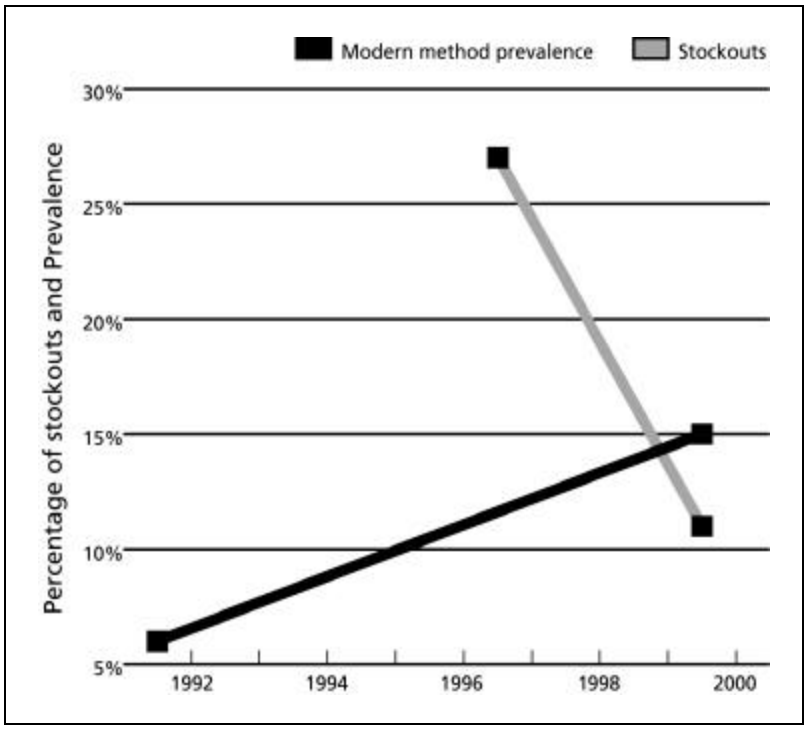
SOURCE : Chandani et al. 2000, Ghana Statistical Service 1994 and 1997, U.S. Bureau of the Census 2000

Figure J-2.
Kenya: Trends in Contraceptive Stockouts and Contraceptive Prevalence, 1989–1998

Error! Objects cannot be created from editing field codes.

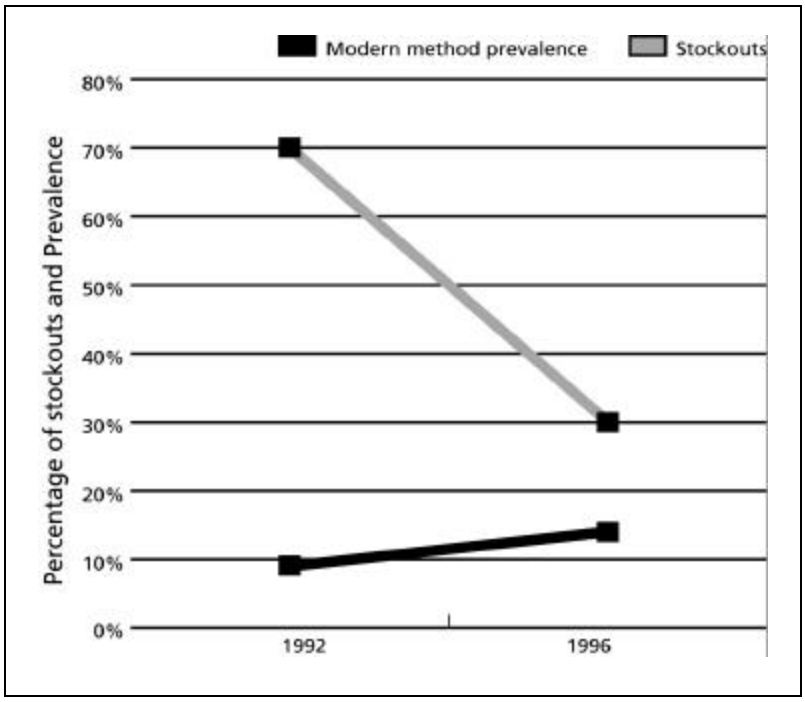
SOURCE : MOH/Kenya 1999, U.S. Bureau of the Census 2000

Figure J-3.
Tanzania: Trends in Contraceptive Stockouts and Contraceptive Prevalence, 1991–1999



Source: National Bureau of Statistics and Macro International 2000, U.S. Bureau of the Census 2000

Figure J-4.
Zambia: Trends in Contraceptive Stockouts and Contraceptive Prevalence, 1992–1996



SOURCE : Barraclough 1999, U.S. Bureau of the Census 2000

Appendix K.
Estimated Values of Donor Contributions for Contraceptive Logistics for 1998 in USD

Country	Contraceptives	Logistics Support
Ghana	$2,825,325	$360,458
Kenya	No Data	$981,000
Tanzania	$4,575,371	$228,000
Zambia	$3,290,000	$276,000

SOURCE : UNFPA and FPLM Documents

Notes

References

General Sources

ADB (Asian Development Bank). 1999. *Health Sector Reform in Asia and the Pacific: Options for Developing Countries*. Manila: Asian Development Bank.

Berman, P. 1995. *Health Sector Reform in Developing Countries: Making Health Development Sustainable*. Harvard Series on Population and International Health. Cambridge: Harvard University Press.

Bongaarts, J. 1995. *The Role of Family Planning Programs in Contemporary Fertility Transitions*. Working paper no. 71, The Population Council, New York.

Bossert, T. 1999. *Decentralization of Health Systems: Decision Space, Innovation and Performance*. Boston: Data for Decision Making Project.

——. 2000. "Decentralization in Chile, Colombia, and Bolivia." Presentation for Data for Decision Making, Washington, June.

Cassels, A. 1995. *Health Sector Reform: Key Issues in Less Developed Countries.* Forum on Health Sector Reform Discussion paper no. 1, World Health Organization, Geneva.

Christopher, M. 1998. *Logistics and Supply Chain Management: Strategies for Reducing Costs and Improving Service*, 2nd ed. Edinburgh: Person Education Limited.

Dadzie. K. Q. "Transfer of Logistics Knowledge to Third World Countries." *International Journal of Physical Distribution and Logistics Management* 20(9): 10-16.

Falkenberg, T., and G. Tomson. 2000. "The World Bank and Pharmaceuticals." *Health and Policy Planning* 15(1): 52-58.

Foster, S. 1991. "Supply and Use of Essential Drugs in Sub-Saharan Africa." *Social Science and Medicine* 32(11): 1201-18.

FPLM (Family Planning Logistics Management). 2000a. *Programs That Deliver: Logistics' Contributions to Better Health in Developing Countries.* Published for the U.S. Agency for International Development. Arlington, Va.: FPLM/John Snow, Inc.

ICPD (International Conference on Population and Development) 1994. *Programme of Action.* Cairo: ICPD.

PAI (Population Action International) "Population Facts and Figures." *Why Population Matters*. http://www.populationaction.org/why_pop/whyfactfig.htm (6 July 2000).

——. "The U.S. Population Assistance Program." *Why Population Matters.* http://www.populationaction.org/why_pop/ whyassistance.htm (5 July 2000). http://www.populationaction.org/why_pop/whypop.htm (6 July 2000).

PRB (Population Reference Bureau). 2000. "2000 World Population Data Sheet." http://www.prb.org/pubs/wpds2000/ (30 June 2000).

Pritchett, L. 1994. "Desired Fertility and the Impact of Population Policies." *Population and Development Review* 20(1): 1-55.

Ross, J., J. Stover, and A. Willard. 1999. *Profiles for Family Planning and Reproductive Health Programs, 116 Countries.* Glastonbury, Ct.: The Futures Group International.

Shane, B. 1996. *Family Planning Saves Lives*, 3rd ed. Washington: Population Reference Bureau.

Trussell, J., and A. R. Pebley. 1984. "The Potential Impact of Changes in Fertility on Infant, Child, and Maternal Mortality." *Studies in Family Planning* 15(6): 267-280.

UNFPA (United Nations Family Planning Association). "About UNFPA." http://www.unfpa.org/about/brochure/main.htm (6 July 2000).

——. 1998. "Donor Support for Contraceptives and Logistics, 1998." http://www.unfpa.org/publications/technical.htm (6 July 2000).

——. 1999. "The State of World Population 1999: 6 Billion: A Time for Choices." http://www.unfpa.org/publications/swp.htm (3 July 2000).

——. 1999. "The State of World Population 1998: The New Generations." http://www.unfpa.org/publications/swp.htm (3 July 2000).

——. 1999. "UNFPA Annual Report 1998."http://www.unfpa.org/ about/report/report98/1998.htm (30 June 2000).

United Nations. 1999. *Levels and Trends of Contraceptive Use as Assessed in 1998*. New York: United Nations.

World Bank. 1994. *The World Development Report 1993: Investing in Health*. Washington: World Bank.

——. 1999. "Linking Reproductive Health and Health Reform." In *Adapting to Change Core Course on Population, Reproductive Health and Health Sector Reform.* Washington: World Bank.

World Health Organization. 1995. *Decentralization and Health Systems Change: A Framework for Analysis.* Geneva: World Health Organization.

——. 1999. The *World Health Report 1999: Making a Difference.* Geneva: World Health Organization.

Selected Country Sources—Zambia

Adams, Inga. 2000. *The Cost and Availability of Reproductive Health Commodities in Zambia: CES Application in Zambia: A Summary of Findings.* Arlington, Va.: Rational Pharmaceutical Management Project/Management Sciences for Health.

Barraclough, A. 1999. *Zambia Health and Population Sector AID: Logistics Component of Family Planning Services Project.* Visit Report for Contraceptive Supply Project, Options, London.

Bartling, M., V. Krishnakumar, C. Mogensen, M. J. Oh, C. Pryce, and G. Sikazwe. 1998. *Joint Procurement Review Mission between the Ministry of Health, the Central Board of Health and the Collaborating Partners*. Lusaka: MOH/Zambia.

Bates, J., F. Mandona, E. Mangani, G. Mwale, R. Lunt, and S. Rao. 2000. *Implications of Health Sector Reform for Family Planning Logistics: Zambia*. Published for the U.S. Agency for International Development (USAID). Arlington, Va.: FPLM/John Snow, Inc.

Bennet, S., N. Godfrey, J. Axe, M. Daura, D. Thomas, H. Haak, and S. Tunkaya. 1998. *An Evaluation of District-Level Cost Sharing Schemes*. Lusaka: USAID.

CBOH (Central Board of Health)/Zambia. 1997. *Manual on Stores Procedures for District Hospitals*. Lusaka: CBOH/Zambia.

——. 1998a. *District Health Planning Guide 1998*, vol. 1. Lusaka: MOH/Zambia.

——. 1998b. *Manual on Stores Procedures for Health Centers*. Lusaka: MOH/Zambia.

Daura, M., and D. M. Mulikelela. 1998. *Analysis of Donor Funding to the Health Sector: 1995–1999*. Lusaka: University of Zambia.

Feilden, R., and O. F. Nielsen. 1998. *Immunization and Health Reform: Making Reforms Work for Immunization.* Prepared for WHO/GPV/EPI. Geneva: World Health Organization

Godfrey, N., J. Axe, M. Daura, D. Thomas, H. Haak, and S. Tunkaya. 1998. *Mid-Term Output to Purpose Review of the Zambia Health and Population Sector Aid Programme (ZHPSA)*. London: Institute for Health Sector Development.

Helling-Borda, M., J. Bates, M. Mutukwa, M. Liedjeman, and S. Capper. 1997. *Second Report on the Establishment of the Essential Drugs and Medical Supplies Store*. Lusaka: MOH/Zambia.

McLaughlin, J. 1999. *Designing an Essential Package of Health Services in Zambia: A Case Study.* Flagship Course on Health Sector Reform and Sustainable Financing, module 5. Washington: World Bank.

Nanda, P. 1999. "The Impact of Health Sector Reforms on Reproductive Health Goals in Zambia." In *Implications of Health Sector Reform for Reproductive Health Programs and Strategies: Case Analysis of Zambia*. Washington: Center for Health and Gender Equity.

U.S. Bureau of the Census, International Database. *Prevalence of Contraceptive Use by Method and Urban/Rural Residence, Zambia, table 0.55*. http://www.census.gov/ftp/pub/ipc/www/idbnew.html (July 12, 2000).

Verhage, R., A. Cross, and W. Bannenberg. 1996. *Zambia: External Consultancy on the Role of Medical Store Ltd, the MOH Procurement Unit and the Dept. of Pharmaceutical Services in the Financing, Procurement, Storage and Distribution of Essential Drugs and Medical Supplies to Public Health Facilities*. Amsterdam: Consultants Health Development.

Selected Country Sources—Ghana

Bowers, G., I. McLellan, P. Antwi, and E. Tetteh. 1999. *Assessment of the Ghana AIDS and Population (GHANAPA) Project.* Washington: TvT Associates, Inc.

Chandani, Y., J. Durgavich, R. Lunt, N. Pehe, and T. Rosche. 2000. *Implications of Health Sector Reform for Family Planning Logistics: Ghana*. Published for the U.S. Agency for International Development. Arlington, Va.: FPLM/John Snow, Inc.

Ghana Statistical Service. 1994. *Report of First Situation Analysis Study of Family Planning Services in Ghana*. Accra: Ghana Statistical Service.

——. 1997. *Report of Second Situation Analysis Study of Family Planning Services in Ghana.* Accra: Ghana Statistical Service.

Jones, E. 1999. *Ghana: Reform of Public Sector Management and Financing.* World Bank Course on Adapting to Change: Core Course on Population, Reproductive Health and Health Sector Reform. Washington: World Bank.

Ministry of Health Ghana, Netherlands Consultancy Team. 1994. *Master Plan for the Ghana National Drug Programme (GNDP) 1995–1999*. (Working Document) Accra: MOH/Ghana.

——. 1999a. *Baseline Study on the Pharmaceutical Sector in Ghana*, Final Report. Accra: MOH/Ghana.

——. 1999b. *Health Sector 5 Year Programme of Work 1997-2001 Joint MOH-Health Partners 1998 Review*. Accra: MOH/Ghana.

Rankin J., K. Johnson, J. Sallet, D. Lee, and D. Ofori-Adjei. 1993. *Rational Pharmaceutical Management Project, Ghana Pharmaceutical Sector Assessment,* Final Report. Boston: Management Sciences for Health.

U.S. Bureau of the Census, International Database. *Prevalence of Contraceptive Use by Method and Urban/Rural Residence, Ghana, table 0.55*. http://www.census.gov/ftp/pub/ipc/www/idbnew.html (July 12, 2000).

Haperen, J. van. 1999. *Summary of Presentation to Option Appraisal Working Group*, April.

World Bank. 1997. *Staff Appraisal Report: Republic of Ghana Health Sector Support Program.* Washington: The World Bank.

Selected Country Sources—Kenya

Blumberg, N. 1999. *Reproductive Health Logistics Management, Kenya APHIA Mid-Term Review*. Minor Issues paper, USAID, Washington.

Collins, D. H., J. D. Quick, S. M. Musan, D. L. Kraushaar. 1996. *Health Financing Reform in Kenya*. Stubbs Monograph Series no. 1, Management Science for Health, Boston.

Durgavich, J., and A. Ferguson. *Logistics and Health Sector Reform in Kenya: A Qualitative Study on the Impact of a Vertical Program on the Development of Health Sector Reforms*. Forthcoming.

FPLM. 2000b. "Technical Proposal and Budget Case Study: Lessons Learned from Experiences of the Logistics Management Unit of the Ministry of Health, Kenya." In *Integrating STI Drugs and Contraceptive Logistics Management Systems*. Arlington, Va.: FPLM/John Snow, Inc.

Miller, R., K. Miller, L. Ndhlovu, J. Solo, and O. Achola. 1996. "A Comparison of the 1995 and 1989 Kenya Situation Analysis Study Findings." *African Journal of Fertility, Sexuality, and Reproductive Health*. 1(2): 162-8.

MOH (Ministry of Health)/Kenya. 1996a. *Kenya's Health Policy Framework Implementation and Action Plans*. Nairobi: MOH/Kenya.

——. 1996b. *National Reproductive Health Strategy: 1997–2010.* Nairobi: MOH/Kenya.

——. 1999. *Bi-monthly Report on Contraceptive Stockouts*. Department of Family Health, Logistics Unit. Nairobi: MOH/Kenya.

___. 2000. *Report of a Workshop on Decentralisation 13th–16th March*, 2000. Draft. Mombasa: MOH/Kenya.

MPND (Ministry of Planning and National Development) and Macro International, Inc. 1998. *Kenya Demographic and Health Survey 1998: Preliminary Report.* Calverton, Md.: Macro International, Inc.

Ndhlovu, L., J. Solo, R. Miller, and K. Miller. 1997. *An Assessment of Clinic-Based Family Planning Services in Kenya*. Washington: The Population Council.

Olson, C., M. Gachara, and A. Ophwette. 1996. *Evaluation of Logistics Improvements in Kenya.* Arlington, Va.: FPLM/John Snow, Inc.

U.S. Bureau of the Census, International Database. *Prevalence of Contraceptive Use by Method and Urban/Rural Residence, Kenya, table 0.55.* http://www.census.gov/ftp/pub/ipc/www/idbnew.html (July 12, 2000).

Selected Country Sources—Tanzania

Ayala, B. 1998. *Integrated Public Sector Supply Status Trip Report IV, March 1-April 3, 1998*. Undertaken for Tanzania Reproductive and Child Health Section and Medical Stores Department by FPLM/John Snow, Inc. Arlington, Va.: FPLM/John Snow Inc.

Chandani, Y., P. Riwa, and T. Rosche. 2000. *Tanzania Situational Assessment of Logistics Systems for Public Health Commodities at Selected Districts and SDPs. Preliminary Report.* Prepared for Ministry of Health/Reproductive Child and Health Section by FPLM/John Snow, Inc. Arlington, Va.: FPLM/John Snow Inc.

Humplick, B. J., ed. 1999. *Report on the Strategic Planning Workshop for a Management Review of the RCH Section*. Dar es Salaam: MOH/Tanzania.

Ministry of Foreign Affairs and DANIDA. 1999. *Draft Report Review cum Identification of Danish Support to the Primary Health Care Transport Management System.* Draft. Dar es Salaam: MOH/Tanzania.

Ministry of Health. 1998. *Memorandum of Understanding Between the Ministry of Health and the Medical Stores Department.* Dar es Salaam: MOH/Tanzania.

National Bureau of Statistics and Macro International. 2000. *Tanzania Reproductive and Child Health Survey 1999: Presentation on Preliminary Report*. Dar es Salaam and Calverton, Md.: Macro International.

Tench, A. 1999. *Tanzania Health and Population Sector Aid: Economic Analysis and Overview of the Essential Drugs Situation in Tanzania with Options for Possible Support Interventions.* London: British Department for International Development.

U.S. Bureau of the Census, International Database. *Prevalence of Contraceptive Use by Method and Urban/Rural Residence, Tanzania, table 0.55*. http://www.census.gov/ftp/pub/ipc/www/idbnew.html (July 12, 2000).