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**MINISTRY OF HEALTH OF GHANA
RATIONAL PHARMACEUTICAL
MANAGEMENT PROJECT
GHANA PHARMACEUTICAL SECTOR
ASSESSMENT
FINAL REPORT**

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INTRODUCTION

The Rational Pharmaceutical Management (RPM) Project is composed of two centrally-funded cooperative agreements with USAID R&D Health, one is with Management Sciences for Health (MSH) and the other with the United States Pharmacopeia (USP). RPM has core funding to work in three major technical areas:

- Strengthening and automating drug registration procedures
- Rationalizing drug procurement and inventory management
- Promotion of rational drug use/strengthening drug information

This work will emphasize skills transfer and training, including computerization, and close collaboration with counterparts and local organizations. RPM is now in the process of selecting a limited set of countries where the core resources can best be applied, given the fit between RPM capabilities and country needs. In order to do this, formal pharmaceutical sector assessments are to be done in five to six countries which seem most promising, based on responses from USAID Missions, the countries which have been scheduled in addition to Ghana include El Salvador, Nepal, and the Organization of Eastern Caribbean States. Probable additional assessment countries with core funds are Bolivia and Ukraine. Mozambique, as well as Russia and an undetermined country in central Asia, will be assessed with Mission funding.

RPM was initially interested in Ghana due to on-going relationships with Dr. David Ofori-Adjei at the University of Ghana Medical School's Centre for Tropical Clinical Pharmacology. Dr. Ofori-Adjei is a major contributor to the MSH coordinated International Network for Rational Drug Use (INRUD), and also serves on the USP International Health Advisory Panel.

During an exploratory visit in May of this year by a two person team from MSH and USAID (Washington), the Ministry of Health (MoH) advised us that they were extremely interested in a pharmaceutical sector assessment, to lay the groundwork for a follow-up study on privatization opportunities in the pharmaceutical sector. Ministry officials wanted to include all ten regions of the country in the regional component of the survey, in order to give the survey a national perspective as well as a sense of ownership on the part of the regions. In addition they did not want the assessment to be seen only as an RPM/Ghana Medical School study. They insisted that members of the MoH National Drugs Committee must play an active role in the assessment, which was welcome news. The Ghana USAID Mission consented to the concept of the assessment, and asked that contraceptive products be included in the scope of the study, in addition to considering the feasibility of integration of the family planning logistics system into the greater MoH system.

The assessment commenced on June 7, and the field phase ended on July 8, the assessment produced a large quantity of raw data on stock management, procurement, and pricing practices in the Cash and Carry Program. The data has been collated and analyzed by RPM staff, and the results are presented in this final assessment report.

The contents of the report are presented immediately following this introduction, the report is divided into two major sections, with annexes following. Section One discusses the assessment purpose and methodology, and the actual process and constraints. Section 1.2 offers a summary of findings in the context of a matrix of pharmaceutical and development indicators, which is followed by a discussion of USAID activities and those of other donors and agencies related to pharmaceutical management. The final part of Section One presents a summary of gaps which may be amenable to RPM interventions, with issues and constraints and prioritized recommendations for RPM activity, followed by a summary of all recommendations by the assessment team. Section Two presents detailed findings and recommendations related to seven aspects of the pharmaceutical system. There are five annexes including a list of acronyms, documents reviewed, persons met, blank forms used for data collection, and the complete set of quantitative data which was collected.

We wish to express our appreciation for the cooperation and openness in sharing information with the assessment team, this made our task much easier and made it possible to collect most of the information envisioned in our study design. A list of persons who contributed to the assessment is found in the annexes, special recognition is extended to Dr. David Ofori-Adjei and his staff at the Centre for Tropical Clinical Pharmacology, who worked closely with the RPM team throughout the assessment. The regional data was assembled entirely through the efforts of the regional Cash & Carry Coordinators for Greater Accra, Brong-Ahafo, Northern, Volta and Western regions, they performed this task with minimal training and under great time pressure, using data collection instruments which have since been improved. They should be recognized and commended for their extraordinary efforts. Data was verified and organized into usable formats and reports by Jennifer Jones, Julie Frye and Queta Clark, of the RPM staff in Washington, they are not responsible for any errors of fact or interpretation, but they can claim credit for making the data presentable and useful.

Finally, we apologize to the reader for the length of the report. Due to the total reliance of the Ghana public sector drug supply system on pharmaceutical cost recovery (the Cash and Carry Programme), considerable attention was given to discussing the policy issues involved, and analyzing the status of each of the individual Cash and Carry revolving funds.

Those who don't need to digest the full details on the Ghana pharmaceutical sector can limit themselves to Section One. A summary of many important findings is presented in Section 1.2, and recommendations which are relevant to the RPM project are discussed in Section 1.6.

SECTION ONE - SUMMARY OF FINDINGS AND RPM OPPORTUNITIES

1 1 RPM Assessment Strategy and Methodology

Assessment Objectives and Study Team Involved

The Ghana assessment had three objectives

- 1 RPM wanted to evaluate the opportunity for work in Ghana over the next four years, using core funds, and we also needed to test and revise our assessment tools
- 2 For the MoH, the study would update findings from the 1992 Regional Fact Finding Exercise on public sector pharmaceutical activities, and provide an information base on which a privatization study could build
- 3 For the USAID Mission, the study would shed light on the feasibility of integrating family planning products into the mainstream MoH logistics system

It was agreed during the May exploratory visit that the MoH National Drugs Committee members would meet as often as needed in the month before the June assessment, to revise and augment the RPM draft assessment tool, and that members of the Committee would be given counterpart responsibility for each aspect of the survey. The Regional Survey component was to be handled by regional Cash and Carry (C&C) Coordinators.

A meeting of all regional Coordinators was scheduled for the first week of the assessment, during which the regional survey tool would be produced to fit the Ghana context, and Coordinators would be trained in the use of the survey instrument and data collection forms.

The assessment was scheduled to begin on June 7, and to continue for 3-4 weeks, depending upon progress. RPM assigned a larger team than originally planned, since this was a first test of the assessment methodology, and because the MoH had asked for a much more extensive survey than initially envisioned. The following team members were assigned from RPM:

James Rankin	Director, MSH Drug Management Program (DMP)
Keith Johnson	Director, USP Drug Information Division
Jean-Pierre Sallet	MIS Coordinator, MSH-DMP and RPM
Dr. David Lee	Coordinator, Central America Drug Use Review Group
Dr. David Ofori-Adjei	Director of the Centre for Tropical Clinical Pharmacology of the University of Ghana Medical School

The team was assisted by Daniel Arhinful (member, INRUD Ghana). Local counterparts were assigned from the National Drugs Committee of the Ghana Ministry of Health, and from the Regional Coordinators for the Cash and Carry Program.

Data Collection Tools and Tracer Drugs

Two data collection instruments were prepared by RPM staff and local collaborators, with input from counterparts, one instrument was prepared for central level data collection, and the other for regional and health facility use. These instruments were based on the RPM Diagnostic Assessment outline, and were designed to minimize "essay" responses by providing for yes/no or multiple choices to describe the most common findings, with space provided to elaborate when the situation could not be summarized through these choices.

Twenty-one drugs commonly used for out-patients in the Ghana public sector were selected as "tracer" drugs to evaluate stock status and procurement and pricing practices, due to the limited amount of time available for field data collection, in-patient drugs were not included. One drug (ampicillin suspension) was added specifically because it is not currently approved for use in the public sector, but it was suspected that some health facilities continue to stock and use the drug. Finally, three family planning items were added, to assess the status of the family planning distribution system. Based on the Ministry of Health procurement records, the twenty-one tracer drugs (exclusive of ampicillin and contraceptives) represented 41% of 1991 purchases and 23% of 1992 purchases.

Standardized data collection forms were prepared to collect data on tracer drugs at the central and regional level, and to collect data on prescribing and dispensing practices in the sample health facilities. The data on prescribing and dispensing were collected according to the standard WHO/INRUD methodology, as described in the 1993 WHO publication "How to investigate drug use in health facilities: drug use indicators."

Annex IV contains copies of the various data collection forms, since the structured survey for central and regional use contains more than one hundred pages, copies are not provided in this report. They are available from RPM on request.

Survey Methodology

The assessment methodology called for two main surveys, a Central Survey and a Regional Survey. The format of the two surveys is presented below.

Central Survey

Central level information was obtained through

- interviews, using the structured survey instrument
- assessment of conditions and equipment at selected institutions
- data collection from documents and records

Study instruments were applied in relevant institutions including

- Ministry of Health
- Ministry of Finance
- University of Ghana
- University of Science and Technology
- Customs, Excise and Preventive Service
- Ghana Standards Board
- Pharmacy Board
- Other relevant institutions

The data for this survey were collected largely by the RPM Team, with the assistance of some of the members of the National Drugs Committee of the MoH

Regional Survey

Regional and district level information was obtained through

- interviews of responsible officials
- assessment of conditions and equipment
- data collection from records
- observation of health worker-patient interaction
- purchase of an antibacterial drug in a private drug outlet

In each region a district was chosen and within that district two health centres were then selected to participate in the assessment. The following institutions took part in the survey

- The Office of the Regional Director of Health Services
- The Regional Medical Store
- The Regional Hospital
- The District Health Management Team
- The District Medical Store (if any)
- The District Hospital
- Two Health Centers

The Regional survey was carried out by the respective regional Cash and Carry Coordinators, as noted, the original intention was to survey all ten regions. However, this proved impossible due to the postponement of the initial workshop. The regions included in the study were

- Brong-Ahafo
- Greater Accra
- Northern
- Volta
- Western

Description of Assessment Process

The actual assessment did not proceed entirely according to plan, due to two constraints

Training for regional coordinators had been planned to coincide with the annual Cash and Carry meeting scheduled for the first week of our assessment. This annual meeting was postponed until the end of June, due apparently to funding constraints. As a result of the postponement, coverage of the survey was reduced from 10 to 5 regions, and the training of the data collectors was limited to two days. Based on the experience of the 1992 Fact Finding Exercise it was felt that the data required could be collected in a week, excluding travelling time, this proved to be barely true. The data were collected, but there was no time to delve deeply into the facilities surveyed, information was captured only if it was immediately available. A survey of the data collectors suggested that the two major problems were the lack of time for training and for data collection.

MoH National Drugs Committee participation in the refinement of assessment tools and in the actual assessment at Central level turned out to be limited, due to the pressure of other responsibilities. This produced some problems in developing the best possible regional survey tool. RPM staff did not receive a copy of the Regional Fact Finding Exercise or the Cash and Carry MIS reports until after the survey tool was developed. This resulted in some gaps in the survey forms. Known gaps have now been corrected for the next regional survey.

These constraints must be kept in perspective, since these sorts of problems are commonly encountered. In the end, the assessment produced a useful set of data on central level activities in drug finance, procurement and logistics, drug policy and legislation, drug information and utilization, quality assurance, and private sector pharmacy activities, thanks largely to the cooperation of a variety of individuals listed in the Persons Met annex. Perhaps more importantly, the Regional Survey produced data on procurement, pricing policy and logistics at the regional and institutional level in five districts which shed a great deal of light on the progress of Cash and Carry, and the issues which need to be addressed. The information also updates in many respects work done in the 1992 Regional Fact Finding Exercise.

All of the regional data arrived for collation and analysis on June 27, on schedule. The regional C&C coordinators spent the day at base to discuss findings and constraints and clarify ambiguities. The regional C&C coordinators were clearly committed to their task, as the data brought back were to a large extent complete.

To assist in analyzing the data Mr. Sallet developed a database tool, "Survey," for data input, and Dr. Ofori-Adjei arranged the services of a data input person (Ms. Lauretta Bannerman, who did a superb job). Three days were required to input the data, and the last week of the field work was devoted to verifying data and designing reports.

The assessment team had hoped to attend the Regional Cash and Carry meeting at Sogakope on Thursday (July 1) or Friday (July 2), to discuss the initial findings of the assessment with the assembled pharmacists. This was not possible, but the preliminary findings were presented on July 6 at the annual meeting of Regional Administrators.

A preliminary version of the assessment report was left in Ghana, to allow those who had contributed information to make sure that the report is accurate, but much work remained to check and verify information collected, and to refine the reports from the "Survey" database. This was accomplished over a one month period by RPM staff in Washington.

The data from the Central and Regional surveys have now been collated and assembled into this report. We are confident that the data in the report is the same as that recorded by the Regional Coordinators, however, there may well have been some transcription errors when they recorded data, and of course not all of the source data is necessarily completely reliable.

It is hoped that the MoH National Drugs Committee, the Regional Administrations and the Cash and Carry Coordinators will closely review the reports and data tables, and report any errors or misinterpretations to Dr. Ofori-Adjei, so that they can be corrected.

As noted, only five regions could be covered by this initial survey, once the Cash and Carry Workshop was postponed. The plan was that, based on the results and lessons learned from the initial study, the survey forms would be revised, and the other five regions would do their own study, with guidance and assistance from the National Cash and Carry Coordinator. This follow-up study may not be necessary, since the information which would be gathered can be obtained as part of the "privatization" study and the pricing policy workshop, which are recommended in Section 1.6 below.

1.2 Summary of Findings - Pharmaceutical and Development Indicators

There are two on-going international efforts directed at developing sets of indicators which would measure the status of public sector pharmaceutical systems. The WHO Drug Action Programme is developing a large set of indicators which will be used by member countries for self-assessment. USAID, through the Latin America Health, Nutrition and Sustainability Contract (LAC/HNS), has sponsored development of a set of 32 indicators which have now been field tested in four countries. This latter work has been coordinated by the MSH Drug Management Program and the Harvard Drug Policy Group, working with the PAHO Essential Drugs Project in Central America. It is expected that the LAC/HNS-PAHO indicator set will be harmonized with the larger WHO-DAP indicator set in the coming months.

It should be noted that the "indicators" discussed in this section are more accurately described as standard measurements, since we do not yet have enough world-wide data to determine norms for the measurements, and it is still unclear what measurements warrant eventual designation as true performance indicators.

No matter how well these measurements stand the test of time as true indicators, they do provide a valuable set of baseline data which can be used to measure the effect of interventions intended to improve pharmaceutical management.

The LAC/HNS indicator data were collected in Ghana, and the results were compared with earlier indicator surveys from Guatemala, Ecuador and Jamaica. The earlier indicator studies took place within the past twelve months. The Guatemala study was done in August/September 1992, with Ecuador following in September/October 1992. The Jamaica data was gathered over a six month period between November 1992 and March 1993. In each case, the logistics data covered the 12 months prior to the study. A different set of 20-25 tracer drugs was chosen for each country, based on the frequency of use and morbidity patterns in the country, but there is considerable overlap since drugs such as aspirin, paracetamol, ampicillin (or amoxycillin), and multiple vitamins are commonly used in most countries. The data collection methodology was the same in theory, since the same manuals and approaches were used, but there certainly were variations in practice, since different data collectors were used and different training was provided.

The International Network for Rational Use of Drugs (INRUD) developed and tested a methodology and user's manual to quantify drug utilization in outpatient health care facilities. The manual has been revised and issued as a WHO-Drug Action Programme manual. The drug use indicators in this section are drawn from the INRUD/WHO manual, and the methods prescribed in the manual were used to collect and analyze drug use data from all four countries. The INRUD methodology has now been applied in ten countries (in addition to Ecuador, Ghana, Guatemala and Jamaica). The full set of indicator results from Ghana, Guatemala, Ecuador and Jamaica are presented in the table on the following page. Also included are average results from ten country studies which looked only at drug use indicators (Yemen, Uganda, Sudan, Malawi, Indonesia, Bangladesh, Zimbabwe, Tanzania, Nigeria and Nepal).

GHANA INDICATOR RESULTS - COMPARISON WITH OTHER COUNTRIES

GHANA GUATEMALA ECUADOR JAMAICA

PUBLIC SECTOR BUDGET AND FINANCE

1. Public sector pharmaceutical expenditure per capita	\$0.46 *	\$3.93	\$0.09	\$1.98
2. Public sector revenue from pharmaceutical cost recovery per curative encounter	N/A	N/A	N/A	N/A
3. % of total government expenditures used for health budget	14.1%	15.0%	7.5%	3.4%
4. % of total government health expenditures used for pharmaceuticals	No budget; all cost sharing	26.0%	1.3%	8.0%

PUBLIC SECTOR PROCUREMENT

1. Existence of policy to limit public sector procurement to items on National Formulary or EDL	Yes	Yes	Yes	Yes
2. Coverage by centralized system for routine procurement of public sector drugs	Yes % not available	27.0%	< 50.0%	80.0%
3. % of average international price paid for last regular procurement of indicator drugs	79%	164-371%	161%	145%
4. % of MOH drugs purchased through competitive methods	87% *	10%	45%	95%

PUBLIC SECTOR LOGISTICS

1. % variation between inventory records and physical stock (CMS)	Tally	0.0%	not calculated		48.4%
	Ledger	14.6%	5.0%	2.6%	
2. Availability in warehouses and health facilities of set of tracer drugs	CMS	100.0%	93.0%	38.0%	100.0%
	RMS	87.0%			
	H.C.	60.0%			
3. % of time out of stock for tracer drugs (CMS)		8.0%	32.0%	79.0%	27.0%

POLICY, LEGISLATION AND REGULATION

1. Existence of National Drug Policy	No	Yes	Yes	Yes
2. Existence of components of drug legislation	Yes	Yes	Yes	Yes
3. Proportion of sampled products registered or licensed	N/A	92.6%	100.0%	79.0%
4. Type of registration system	Manual	Computerized	Mixed	Manual
5. Law regarding generic substitution	No law	No law	No law	No law

FORMULARY/ESSENTIAL DRUGS LISTS & DRUG INFORMATION

1. # drugs on national formulary	222	428	438	1010
2. # drugs on sub-set EDL	No list	50	237	VEN lists**
3. Existence of National Formulary and/or EDL with basic therapeutic information revised within last 5 years	No	Yes	Yes	Yes
4. % of visited public facilities with most current formulary or ED Manual at public sector facilities	45%	30%	25%	100%

DRUG UTILIZATION

1. Population per public health facility	34,308	8,529	6,310	5,800	INRUD Average
2. Average number of drugs prescribed per curative encounter	4.3	1.4	1.3	2.4	2.1
3. % of drugs prescribed by generic names	59.4%	72.0%	37.0%	39.5%	66.7%
4. % of patients receiving injections	55.7%	13.0%	19.0%	3.7%	24.7%
5. % of patients receiving antibiotics	46.6%	27.0%	27.0%	30.0%	43.2%
6. % of drugs prescribed which are actually dispensed	86.0%				76.5%
7. Average duration of dispensing interaction (seconds)	125				58.8
8. Percentage of drugs adequately labelled	12.0%				
9. Patient knowledge of correct use of dispensed drugs	76.0%				64%

PRODUCT QUALITY ASSURANCE

1. Use of WHO Certification Scheme	Limited	Limited	Yes	Limited
2. Existence of functioning system of reporting product quality complaints	No	No	No	No

PRIVATE SECTOR PHARMACEUTICAL ACTIVITY

1. Population per licensed private sector drug outlet	3,438	4,805	3,419	9,700
2. Drug outlets per government drug inspector	262	947	13	62.5
3. Value of total private sector pharmaceutical sales per capita	N/A	\$10.98	\$7.87	\$10.28
4. Total value of drug market, public and private sectors per capita	N/A	\$14.91	\$7.96	\$12.27
5. % of products on National Formulary which are manufactured or co-manufactured locally	70%	71%	50%	15-20%
6. Percentage of instances where an antibiotic was available from a licensed outlet without a prescription	85%	100%	100%	

* Ghana CMS purchases only there were also substantial direct purchases by regional stores and health facilities

**Jamaica health facilities have individual VEN lists which are functionally equivalent to sub-set essential drugs lists

Grey shading indicates information was not collected in the survey

The findings from the indicator studies are discussed below, with the emphasis on Ghana in comparison to the other countries. The indicators are divided into eight categories:

- 1 Public Sector Budget and Finance
- 2 Public Sector Procurement
- 3 Public Sector Logistics
- 4 Policy, Legislation and Regulation
- 5 National Formulary/Essential Drug Lists and Drug Information
- 6 Drug Utilization
- 7 Product Quality Assurance
- 8 Private Sector Pharmaceutical Activity

Public Sector Budget and Finance

In 1992 Ghana (at 14.1%) spent a lower percentage of its recurrent budget on health than Guatemala (15%) or Ecuador (7.5%), Jamaica used about 3.4% of its budget for health.

Ghana also spent much less per capita on public sector pharmaceuticals (\$0.46) than Guatemala (\$3.93) or Jamaica (\$1.98), if only Ghana CMS purchases are counted. In Ghana, however, a significant portion of pharmaceutical purchases do not go through the CMS system, and there is no central record of direct purchases by Regional Medical Stores and by health facilities. The true public expenditure is higher than the total shown in the indicator table, it may actually be closer to \$1.00 per capita. In Ecuador, there is a country-wide shortage of pharmaceuticals in the public sector, which is reflected in the \$0.09 in pharmaceutical expenditure per capita (this is not a misprint).

None of the countries have compiled country-wide data on cost recovery revenue, Ghana is the only one of the four countries which relies heavily on cost recovery revenue to finance pharmaceutical procurement. In fact, Ghana may be the only developing country which had no public sector budget expenditures on pharmaceuticals apart from cost recovery funds in the last twelve months. The goal of the Cash and Carry Programme in Ghana is to recover the full replacement cost of pharmaceuticals, with each medical store and health facility operating separate revolving drug funds.

The team did not have access to information to determine whether or not this is being achieved, but the data gathered in this assessment suggest that de-capitalization is probably occurring in at least nine of the twenty sites visited.

Public Sector Procurement

All four countries have a policy which limits public procurement to drugs on the national formulary, in Ghana, this is enforced at least for purchases which go through the MoH Procurement Committee. Each of the four countries also has a central procurement system which is nominally responsible for purchasing some or all MoH pharmaceuticals. In Ghana, the official policy is that all facilities must purchase through the central system unless MoH approval is given, and the percentage purchased through the central system was close to 100% prior to the Cash and Carry Programme. It is not known what percentage was purchased centrally in 1992 after Cash and Carry, but the range of central purchases from the five regional medical stores surveyed was 39-91%, and health facilities purchased between 17% and 100% from the regional medical stores. In Guatemala, the official policy allows direct purchases by facilities, and only 27% of MoH drugs were centrally purchased, in Ecuador the percentage was 50% or less, and it was about 80% in Jamaica.

Ghana has a policy which mandates competitive tender through the Ghana Supply Commission for all routine purchases, the MoH achieved 87% competitive tender procurement for the central purchases, but the substantial purchases made directly by regional medical stores and health facilities did not go through a formal tender process. As might be expected, the private sector prices were higher - RMS private sector prices averaged 109% of CMS price, and health facility private sector purchases averaged 131% of the price from the RMS. Each of the other countries have policies prescribing competitive procurement, but Jamaica may be the only one which is coming close to complying with the policy (95% of observed purchases were competitive), in Ecuador the percentage was about 45%, and in Guatemala it was only 10% competitive purchases.

The Ghana central purchasing system is doing a good job of obtaining competitive prices at least for the tracer drugs, in 1992 the MoH average acquisition prices were only 79% of the MSH Average International Price, while the other three countries paid considerably more than average international price for a market basket of drugs.

Public Sector Logistics

The most important indicator of a logistic system's effectiveness is the presence of essential drugs in health facilities where they are needed. In Ghana, 100% of the twenty-one tracer drugs were in stock at Central Medical Stores, at the regional medical stores the average was 87%, and it fell to an average of 60% at the twenty health facilities (70% in regional hospitals, 76% in district hospitals, and 48% in health centers). These findings illustrate the problems with transport and distribution in the Ghana logistics system. In Ecuador, on average only 38% of the tracer drugs were in stock at health facilities visited, while Guatemala showed an average of 93%, and in Jamaica 100% of tracer drugs were in stock at the time of the visit.

The percentage of time tracer drugs were out of stock in a twelve month period can be a good indicator of the logistics system performance over time. In Ghana, the percentage of time out of stock at the Central Medical Stores was 8% for the tracer drugs. The average for regional medical stores was 7.2%, and for the twenty health facilities, the average was 10.5% (range 0% to 30.3%). Given that all facilities reported difficulty in obtaining drugs, it is unclear why the percentage of time out of stock is not higher, but this may be a function of the sample of tracer drugs and/or the accuracy of data which were collected pertaining to time out of stock. In the three earlier indicator surveys, tracer drugs were out of stock for a significant percentage of the prior twelve months, Jamaica showed 27%, Guatemala 32%, and Ecuador 79% (which corresponds to the low expenditures and the low percentage of tracer drugs in stock).

The average variation between stock records and physical stock count is a useful measure of the accuracy and currency of the inventory record system, and can be at least an indirect indicator of the potential for leakage from the system. In warehouses in developed countries, an average inventory variation of greater than 1% would be cause for alarm, in developing country systems, acceptable norms are less clear, but an average variation lower than 5% may be a reasonable goal. In Ghana, we have data from three levels of the system. At CMS, the tally cards were accurate, with an average variation of 0%, while the ledgers showed a variation of 14.6%. At the five regional medical stores, the average variation was 2.9% for tally cards and 4.7% for ledgers. At health facilities, the performance was worse, with average variations of 11.3% for tally cards and 15.8% for ledgers, some health facilities maintain only one of the two record systems. In the earlier indicator studies, data from Central Medical Stores was aggregated with that from health facilities, Guatemala (5%) and Ecuador (2.6%) showed low average variations, while Jamaica's average (48.4%) suggests that records are not very accurate, and leakage may be a problem.

Policy, Legislation and Regulation

A National Drug Policy is an important tool for policy makers and managers in Ministries of Health, which provides a mandate for reforming and improving the public sector pharmaceutical system. In Ghana, there is no officially adopted National Drug Policy backed by legislation. However, a draft policy was prepared to guide the MoH as part of the actions towards the development of an essential drugs list and a national formulary in 1988. Efforts were made by the National Drugs Committee to further develop the policy document. This action is presently dormant due to the inactivity of the National Drugs Committee. Guatemala, Ecuador and Jamaica have National Drug Policies which have been approved by Government.

In order to assure appropriate monitoring and control of drug use, national drug legislation should address registration and licensing, manufacturing, importation, exportation, storage, distribution, supply and sale of drugs. In Ghana, legislation concerning drug control was enacted in 1961 (*Pharmacy and Drugs Act, 1961 Act 64*). This Act has not been revised since. However several amendments and regulations have been added. The last regulation was made in 1990 and it concerned penalties for infringement of sections of the act. A new act has been passed (Food and Drugs law, January 1993) but is yet to be published. The implementing authority of Act 64 is the Pharmacy Board. Guatemala, Ecuador and Jamaica have adequate legislation in place (although it is not necessarily enforced effectively).

Drug registration is one important drug control mechanism, ideally all products on the market which are covered by registration laws should be registered. In Ghana, the total number of registered pharmaceutical products is made up of 1574 specialties (this means, for example, that Septrin and Bactrim are counted separately). We were not able to get a meaningful sample to determine what percentage of products actually on the Ghana market are registered. Since it is known there are illegal imports from neighboring countries, it is unlikely that all products sold by pharmacies and chemical sellers are registered. In the earlier indicator studies, limited data were compiled, in Guatemala, 92.6% of drugs checked were registered, while the percentage was 100% in Ecuador and 79% in Jamaica.

A computerized drug registration tracking system is virtually essential in order to really keep track of thousands of drug products, manual systems can accomplish the basic task of registration, but it is difficult to retrieve information from the manual records, which can lead to a "file and forget" approach. Guatemala has implemented a computerized registration system, and computerization is underway in Ecuador. Jamaica and Ghana still have only manual registration record systems, though Ghana is actively interested in computerization.

Generic substitution - the practice whereby pharmacists substitute a generic equivalent product when a brand name drug is prescribed - can produce significant savings, if cheaper generic prices are passed along to the consumer. None of the four countries have a law which addresses the issue, generic substitution is not specifically permitted, but neither is it forbidden. Reportedly generic substitution is common in practice in all four countries, both in public and private sectors.

National Formulary/Essential Drug Lists and Drug Information

A national formulary list is usually the first step towards rationalizing drug consumption and use in the public sector, and in some countries the list applies to the private sector as well.

In general the lower the number of drug substances which are included on a national formulary list, the easier it is to control costs, there are, however, no absolute standards for the correct number of drugs on the list. Ghana has the most restricted formulary list of the four countries studied, with 222 drug substances. Jamaica has by far the largest list, with 1010 drug substances. Guatemala (428 drugs) and Ecuador (438 drugs) are in the middle range, and in all four countries, the national formulary list applies only to public sector facilities and health care providers.

Essential drug lists in some contexts are equivalent to national formulary lists, in other countries there is an essential drug list which is a sub-set of the national formulary list. Usually these smaller lists are applicable to primary care settings and in some cases they apply only to a certain set of prescribers (such as village health workers or community health nurses).

Ghana does not have a sub-set essential drugs list which applies throughout the country, though some regions and districts have developed such lists. In Guatemala, the essential drugs list has 50 drug substances, and in Ecuador there is a similar list of 237 drug substances. There were no data on essential drugs lists from Jamaica.

Given the shortage of commercially published drug information in most developing countries, a national formulary manual is vital to provide information on the proper use of drugs included on the national formulary list. If the manual exists, but has not been revised within five years, it may not reflect current information on the drugs listed (and may have no information on drugs which have been added to the formulary list). In Ghana, a revised manual exists in draft (since 1991) but it has not been published, the earlier 1988 manual is still being used (where available). Guatemala, Ecuador and Jamaica have published national formulary manuals within the past five years.

In order to be useful, a national formulary manual must be in the hand of prescribers and dispensers in the public sector. In Ghana only 45% of the twenty health facilities visited had a copy of the 1988 formulary manual. In Jamaica, 100% of the facilities visited had a copy of the current formulary manual, the situation was worse in Guatemala (35% had a manual) and Ecuador (25% of facilities had the formulary manual).

Drug Utilization

The ratio of population to the number of public health care facilities indicates the scope of coverage by the public health care system. There is no standard or correct ratio, but it is clear that Ghana with 434 public facilities, including hospitals, health centers and health posts, (34,308 people per facility) has significantly lower per capita coverage than Guatemala (8,529 per facility), Ecuador (6,310 per facility) or Jamaica (5,800 per facility).

The higher the number of drugs prescribed per patient encounter, the higher the costs of drug therapy (and the greater the chance for adverse drug reaction or interaction). The average number of drugs prescribed per curative encounter was 4.3 in the Ghana sample, compared to 1.4 per encounter in Guatemala, 1.3 per encounter in Ecuador, and 2.4 drugs per encounter in Jamaica. The average from ten INRUD studies was 2.1 drugs per encounter. These results suggest that over-prescribing is a problem in the Ghana public sector, and that a successful drug use review program with targeted interventions to rationalize prescribing could reduce wastage of scarce resources.

Generic prescribing is recommended in order to assure that the lowest cost generic product available can be dispensed. In the Ghana sample, 59.4% of drugs were prescribed generically. In Guatemala, 72% of prescriptions observed were written as the generic name, in Ecuador the percentage was 37%, and it was 39.5% in Jamaica. The INRUD study average was 66.7% generic prescribing.

In most patient populations, relatively few patients really need injections, and the cost and potential risk of adverse reaction is much higher with injections than with other routes of drug administration. In Ghana, 55.7% of the drugs prescribed were injections, although this could possibly be justified by morbidity patterns, it is likely that injections are being overused in the sample facilities. This reinforces the need for drug use review and targeted interventions to reduce overuse of injections. In Guatemala, 13% of observed cases received injections, in Ecuador, the percentage was 19%, and it was only 3.7% in the Jamaica sample. In 10 INRUD studies, 24.7% of cases received injections.

Antibiotics are indicated only to treat established bacterial infections or to protect against such infection, in many (if not most) countries antibiotics are overused, leading in some cases to the emergence of resistant bacteria and in all cases to wasted resources. In Ghana, 46.6% of cases received antibiotics, this result is less of an outlier than the number of drugs and injections per case, but it still suggests room for improvement. In Guatemala and Ecuador, 27% of observed cases received antibiotics. In Jamaica the percentage was 30%, and in the ten INRUD studies, it rose to 43.2%.

The remaining drug use indicators were not collected in Guatemala, Ecuador and Jamaica, but we do have averages from the INRUD studies for comparisons.

The percentage of drugs prescribed which are actually dispensed is a good indicator of how well the drug supply system is working, when used in concert with the percentage of tracer drugs in stock. Used alone, this indicator may be misleading, because prescribers in many public facilities tend to prescribe drugs they believe are in stock. This indicator has recently been added to the INRUD/WHO methodology, and only two countries have reported results. In Nepal, 83% of the prescribed drugs were dispensed, in Nigeria the percentage was 70%, and it was 86% in the Ghana sample.

The average duration of the dispensing interaction is intended to measure the time it takes pharmacists to fill prescriptions and to provide information to patients. In Ghana, the average dispensing time was 125 seconds (slightly over two minutes). INRUD data is available from three countries, the average dispensing time was 58.8 seconds (less than a minute), the range was 86.1 seconds in Nepal, 77.8 seconds in Tanzania, and only 12.5 seconds in Nigeria (reflecting the use of prepackaged drugs). None of these results suggest that pharmacists spend much time counselling patients on proper use of drugs.

The percentage of drugs dispensed which are properly labelled is the newest INRUD/WHO indicator, and Ghana is the first country reporting results. In the INRUD/WHO definition, proper labelling requires that each drug dispensed be labelled with at least the patient name, the drug name, and instructions for when the drug should be taken. In the Ghana sample, only 12% of the drugs dispensed were properly labelled. The most common item missing was the drug name, reportedly pharmacists are reluctant to include this because patients may be tempted to simply buy the same medication in the private sector rather than return to the health facility, if the disease (or symptoms) recur or in the case of chronic medication.

The real indicator of the effectiveness of labelling and verbal instructions provided by the prescriber and dispenser is whether or not patients understand how to take the drugs they have received. This is measured through interviews with patients who have just left the dispensing area. In the Ghana sample, 76% of patients interviewed knew how they were supposed to take their drugs. Given the relatively brief total dispensing time and the low percentage of drugs which were properly labelled, it is surprising that 76% of patients could repeat the proper instructions. INRUD has prior data from six countries, on average, 64% of patients could accurately repeat instructions for drug use, the range was 27% to 82%.

Product Quality Assurance

The first line of defense in quality assurance is careful selection of manufacturers and suppliers, but it is equally important that countries implement programs which solicit complaints from providers and consumers concerning defective products, and that these complaints be followed up by testing of the suspect products and feed-back to the source of the complaint. Ghana has not implemented a formal program to solicit reports on defective products (nor have Guatemala, Ecuador or Jamaica)

Relatively few developing countries have effective drug testing laboratories, in Ghana, there are now four testing labs (Pharmacy Board, Pharmacy School, Ghana Standards Board, and Customs), but all of these laboratories have difficulty in obtaining reagents and standards, which limits the scope of testing (as discussed in Section 2.6)

The WHO Certification Scheme is intended to provide some assurance as to drug quality in international commerce, by relying on a combination of certifications concerning product quality to be provided by manufacturers and by exporting country regulatory authorities. The world-wide use of this system is currently being evaluated by WHO. The LAC/HNS indicator assesses use of the WHO Certification Scheme in three categories - formal membership in the Scheme, use in procurement by importing countries, and response to requests for certification by the regulatory agency in exporting countries. We received conflicting information as to whether Ghana is an official member of the Certification Scheme, the Pharmacy Board does request certification of licensing status in the exporting country when registering a drug, and states that it is prepared to issue certificates of licensing status for products manufactured in Ghana. Guatemala is a member of the Scheme, but does not use it in procurement, the regulatory agency has not received requests for certification from other countries. Ecuador is a member of the Scheme, uses aspects of the Scheme in procurement, and issues certifications on request (it is unclear how many certifications have been issued). Jamaica is also a member of the Scheme, but does not use it routinely in procurement, it is unclear how many certifications have been issued to other countries.

Private Sector Pharmaceutical Activity

The population per private sector drug outlet is intended to measure access to private sector drug distributors. Ghana has 413 pharmacies and 4037 chemical sellers, yielding a ratio of 3,438 people per licensed drug outlet. Guatemala showed 4,805 persons per licensed outlet, the ratio in Ecuador 3,419 to one, and in Jamaica there were 9,700 persons per outlet.

The number of drug outlets per government drug inspector is an indirect measure of the government's ability to monitor practices in the private sector, at least in theory, the lower the number of outlets per inspector, the more likely it is that the inspectors are able to monitor drug sellers. Ghana has 17 drug inspectors (15 from the Pharmacy Board and two who work for the Ghana Standards Board), this produces a ratio of 262 outlets per inspector. The 15 Pharmacy Board inspectors are made up of five from the Pharmacy Board itself and the 10 regional Directors of Pharmaceutical Services. In 1992, 282 pharmacies were inspected by the Pharmacy Board. In Guatemala, there are 947 outlets per inspector, in Jamaica the ratio was 62.5 per inspector, and in Ecuador it was only 13 outlets per inspector.

We were unable to get reliable estimates of the total private sector drug sales in Ghana, and because of the lack of information at MoH on total purchases by regions and facilities, it is not possible to project the total value of drug sales in the country in 1992. According to Ghana Customs, the total declared value of pharmaceuticals manufactured in Ghana was 9 billion Cedis (about US\$15 million) in 1992, the declared value of drug imports was 1.7 billion Cedis (about US\$ 2.8 million). If this were taken as the size of the total market, it would mean the total market was \$17.8 million, or about \$1.19 per capita. This is undoubtedly a gross underestimate of the true market size in terms of public and private sector sales. According to a 1992 UNIDO report, the 1990 total of public and private annual expenditures on pharmaceuticals in Ghana was US\$10.00 per capita. This was cited in the 1993 **World Bank Development Report**, it is unclear what sources of information were used for the estimate. Estimates of varying reliability were compiled for the countries in the earlier studies. Guatemala reported private sector sales of \$10.98 per capita, yielding a total market of \$14.91 per capita. Ecuador reported \$7.87 per capita in private sales, and a total market of \$7.96 per capita (reflecting the minimal public sector expenditures). Jamaica reported private sector sales of \$10.28 per capita and a total market of \$12.27 per capita.

The percentage of products on the national formulary list which are locally manufactured reflects the private sector's capability to meet public sector procurement needs, it does not mean that all of these products are in fact purchased by the respective Ministries of Health. In Ghana, about 70% of drug products on the national formulary list are manufactured in Ghana. In Guatemala, 71% of formulary products can be manufactured locally, in Ecuador the percentage is 50%, and in Jamaica it is estimated at 15-20%.

Most countries have laws which forbid the sale of certain drugs (such as antibiotics) without a prescription, Ghana has such a law, as do Guatemala, Ecuador and Jamaica. In Ghana, a simulated purchase survey found that 17 of 20 private pharmacies (85%) sold an antibiotic without a prescription. In Guatemala and Ecuador, all pharmacies in the survey sold antibiotics without a prescription, the study was not done in Jamaica. This direct sale of antibiotics (in violation of the law) to the public has a much greater effect in producing the world-wide increase of bacterial resistance to the drugs than does over-prescribing by physicians, according to many authorities.

The following table presents general health and development indicators for the same four countries, extracted from the World Bank's **1993 World Development Report**, this will allow interested readers to help put the pharmaceutical indicators in context

W B. DEVELOPMENT INDICATOR - 1993	GHANA	GUATEMALA	ECUADOR	JAMAICA
1993 Population (millions)	15.3	9.5	10.8	2.4
1991 Ranking (GNP per capita) 127 countries	26	47	49	60
GNP per capita, 1991 (US\$)	400	930	1000	1380
Average GNP annual growth, 1980-1991	-0.3%	-1.8%	-0.6%	0%
Average annual inflation, 1980-91	40%	15.9%	38%	19.6%
Life expectancy at birth (Years), 1991	55	64	66	73
Total adult illiteracy, 1990	40%	45%	14%	2%
Female illiteracy, 1990	49%	53%	16%	1%
Per Capita Development Assistance (US\$), 1991	\$47.2	\$20.8	\$20.4	\$69.7
Total external debt, 1991 (Millions US\$)	\$4,209	\$2,704	\$12,469	\$4,456
Average annual growth in population, 1980-91	3.2%	2.9%	2.1%	0.5%
Population/physician, 1990	22,970	No data	980	No data
Population/nurse, 1990	1,670	No data	620	No data
Attended births, 1985	73%	19%	27%	89%
Babies with low birth weight, 1985	17%	10%	10%	8%
Infant mortality rate, per 1000 live births, 1991	83	60	47	15
Years of life lost per 1000 population, 1990	55	41	21	No data
Prevalence of malnutrition under 5, 1990	36%	34%	38%	8%

1 3 USAID Ghana Health Activities and Concerns

At the time of the May preliminary RPM visit to Ghana, the USAID Mission Director and the health staff made it very clear that the primary focus of Mission activities is population rather than health. The Mission expressed no interest in expanding into pharmaceutical management, and made it clear that they feel that such an expansion could adversely impact on current programs even if Mission funds were not used to support such an expansion. The Mission concurred with the assessment, with the condition that attention be paid to the feasibility of integrating family planning logistics into the regular Ministry system, and that this aspect should be coordinated with the Family Planning Logistics Management Project, managed by John Snow, Inc.

USAID is the primary source for family planning commodities for both the Ministry and for the Ghana Social Marketing Program, the value of contraceptives shipped since 1990 (including those planned for the coming year) is over five million dollars. There is an ongoing Ghana Family Planning Project, which is managed by the Futures Group, this project focusses on social marketing and contraceptive distribution.

USAID has supported a number of activities aimed at policy reform related to family planning, and is in the process of providing an advisor in financial management to the Ministry of Health. USAID provides support for fellowships and training in areas of relevance.

The Mission notes that they expect to begin the design soon for a major new bilateral project. This project will focus on population, and there are no plans to incorporate general assistance in improving pharmaceutical management into the project.

Given Mission priorities, there would be little chance of obtaining Mission "add-on" support for pharmaceutical management work by RPM, due to the focus on population and the limited financial and human resources available to the Mission. It is unclear to what extent the Mission would be prepared to concur with the idea of RPM technical interventions in Ghana, even if all work was done with RPM core funds.

1.4 Ministry of Health Concerns Related to Pharmaceutical Management

Policy directions and priority goals for the Ministry in 1993 were to

- Develop more effective systems for surveillance, prevention and control of communicable and non-communicable diseases of social and economic significance, including malaria, diarrhoeal disease, ARI, tuberculosis, measles, tetanus, AIDS, other STD, schistosomiasis, and guinea worm "Multiple strategies" for immunization were to be used to achieve 80% coverage for childhood immunization
- Intensify maternal and child health (MCH) services and family planning, and support effective population control strategies
- Decentralize health management to the district and sub-district level
- Strengthen planning, monitoring and evaluation at all levels
- Strengthen the quality and range of existing medical, mental and dental services, with emphasis on strengthening regional and district hospitals
- Promote accelerated development and rationalization of human resources in the Ministry of Health
- Intensify health education, focussing on smoking, alcohol abuse, drug abuse, sedentary lifestyles and nutrition
- Develop appropriate logistic support and supply systems for ensuring adequate quantities of drugs, consumable medical supplies, and medical equipment Focus on drug estimation, inventory control, rational prescribing and rational use of drugs
- Develop mechanism for proper maintenance and repair of vehicles, equipment, physical structures, and fittings
- Strengthen biomedical, social, psycho-social and applied research, and research into herbal medicine Priority areas include health financing, health system management and delivery of community based services

Senior managers at the Ghana Ministry of Health, including the Deputy Minister of Health, the Director of Medical Services, and the Director of Planning, told the RPM assessment team that improving the pharmaceutical management system is the highest priority in the Ministry

Interest has been expressed by all of these officials in exploring the possibility of technical assistance through the RPM project The exact nature of technical assistance desired is unclear, this will to some extent be determined by the Ministry's reaction to the recommendations in the RPM assessment report, and by the choices made concerning the future structure of the drug supply system

Our clear impression was that the primary interest of the Ministry is technical assistance to strengthen the drug supply system, with secondary interest in promoting drug information and rational use and in strengthening the drug registration system

1.5 Relevant Activities of Donors and International Agencies

Several donors and agencies provide assistance to the Ministry of Health, in recent years there has been a significant backlog of unspent funds (one estimate of the pipeline is \$160 million), but the Ministry is now actively exploring ways to maximize the benefits of donor assistance

The following donors and agencies are now (or may become) active in areas related to pharmaceutical management

- World Bank
- UNICEF
- Overseas Development Agency (ODA)
- WHO - SHS and DAP
- Danida
- Netherlands
- The European Economic Community (EEC)

World Bank

The Second Health and Population Project is a \$27 million World Bank loan, with the activities spanning 1992 through 1996

The following information on loan activity areas and respective funding, for 1993 through 1996, was provided by the Ministry of Health

<u>Activity</u>	<u>Budget 1993-1996</u>
1 Strengthening primary health care (PHC) management	\$750,000
2 PHC infrastructure (Includes radio communication system)	\$6,012,992
3 Drug and vaccine purchases	
Drug purchases (used for foreign purchases)	\$4,200,000
Vaccine purchases	\$1,800,000
4 Medical stores rehabilitation (Includes funds for CMS, 10 RMS, inventory control system, pharmacy training, and strengthening of quality testing)	\$2,662,125
5 Hospital equipment (3 northern regions)	\$3,658,300
6 Hospital equipment Maintenance (3 northern regions)	\$1,436,915
7 Family planning (Includes funds for MoH contraceptives and for PPAG clinics and vehicles, equipment and training)	\$4,739,440
Total 1993-1996	\$23,966,548

The loan is currently the main source of funds available for improvements in the pharmaceutical management system. It also now provides the foreign exchange for the Ministry of Health drugs which are purchased outside Ghana. In 1993, the Ghana Supply Commission estimates that the cost of these external purchases will be about \$2.4 million, that would leave less than \$2 million in that line item to last through 1996. This suggests that additional sources of funding will be needed for external drug procurement.

Reportedly there are loan funds available to support technical assistance in pharmaceutical management, once the Ministry of Health determines what is required (and the World Bank agrees).

UNICEF

UNICEF has supported development of Bamako Initiative clinics, with mixed results, reportedly, this program will not be extended beyond the current level of 10 districts (one per region), and in the future the Bamako Initiative in Ghana will focus on strengthening management at the district and sub-district level. As in many countries, UNICEF provides significant support to immunization and oral rehydration programs in Ghana, and is providing support for fellowships and local training.

Overseas Development Agency

ODA is most interested in strengthening management systems at the central Ministry of Health, and at the regional, district and sub-district level. Recently ODA supported a study of the transport problems in the Ministry, and is supporting advisors in transport and financial management.

The ODA Ghana office is intimately familiar with the problems in the pharmaceutical management system, and is interested in helping to resolve the problem, particularly at the regional and district levels.

WHO - SHS and DAP

The WHO Strengthening Health Systems (SHS) program has been active in helping the Ministry of Health develop and implement a plan for decentralization, WHO-SHS also helped prepare terms of reference for a proposed study which would consider options for privatizing parts of the public sector pharmaceutical system. WHO-SHS will no doubt continue to play an important advisory role in decentralization, including any decentralization of the pharmaceutical system.

The WHO Drug Action Programme has supported studies of drug use recently, and has in the past helped develop a national drug policy which was drafted but never implemented. It is unclear whether or not WHO-DAP will take a more active role in assisting the Ministry of Health to improve the drug supply system. WHO-DAP will co-sponsor a workshop on Rational Drug Use, with Management Sciences for Health, in Accra in March, 1994.

Danida

Danida is planning to support primary health care in the Upper Western region, and may have some interest in improving the drug supply system in that region.

The Netherlands

The Netherlands has reportedly agreed to fund a study which would determine the feasibility of privatizing all or part of the public sector out-patient pharmaceutical system. They are also reportedly considering a longer term project which could include a focus on pharmaceutical management.

EEC

The EEC recently sent a mission to Ghana to explore needs, one area mentioned as needing attention in the EEC sponsored report was pharmaceutical management. It is unclear whether EEC assistance will materialize, or whether such assistance would have a pharmaceutical management component.

1.6 Gaps and Recommendations Concerning Possible RPM Assistance

The Rational Pharmaceutical Management Project is expected to work in three technical areas with core funding

- Strengthening and automating drug registration procedures
- Rationalizing drug procurement and inventory management
- Promotion of rational drug use/strengthening drug information

As noted, the main focus of RPM technical assistance is skills transfer to local counterparts, rather than long-term expatriate advisors, the project will support local organizations which will provide technical assistance with periodic supplementation by short term advisors from RPM. The availability of suitable local collaborators is mandatory for selection of a country for long-term assistance.

RPM has core funds to support a total of six interventions, which may be divided among two or three countries, since these funds are limited, it is incumbent upon RPM and USAID to carefully select countries to assure that maximum impact is obtained with the core funds. Since Ghana is the first of six assessments, it is premature in some respects to say that Ghana is the best possible venue for RPM work. It should be understood that RPM does not have the resources to implement all of the technical assistance activities described in this Section, and that if RPM works in Ghana, choices will be required as to the activities actually implemented in each technical area.

There are gaps in the Ghana pharmaceutical system, in each of the RPM technical areas, which would probably respond to RPM technical assistance. In each of these cases there are also issues and potential constraints which must be acknowledged and resolved in order to make RPM technical assistance useful or possible.

This section addresses only those gaps and recommendations relevant to possible RPM technical assistance, other recommendations are summarized in Section 1.7 and discussed in detail in Section 2.1.

Suggestions for each technical area (procurement/inventory management, drug registration, and drug information/rational drug use) are organized as follows:

- Summary of gaps relevant to RPM technical areas
- Recommendations
 - Prioritized suggestions for action
 - How the RPM Project could help
- Potential counterparts and collaborating organizations
- Potential constraints and MoH action needed

PROCUREMENT/INVENTORY MANAGEMENT

SUMMARY OF GAPS RELEVANT TO RPM TECHNICAL AREAS

The current centralized system for purchasing and distributing drugs to regional medical stores and then on to facilities is not functioning properly (and has not functioned well for several years at least) The problems with the system are detailed in Section 2 1, in summary, the most severe problems are

- lack of adequate and consistent pricing procedures in the Cash and Carry Programme, and lack of information on performance of the individual revolving drug funds (at least nine of twenty funds assessed seem to be de-capitalizing)
- lack of reliable information on needs and consumption, combined with poor information flow from CMS and the MoH to regions and districts and vice versa, leading to procurement decisions which are based on inadequate or inaccurate information
- lack of reliable access to funds for transport at the RMS and health facility level, combined with the lack of delivery from CMS, make it more difficult than necessary to move drugs from the central level through the regional medical stores to health facilities
- the relative isolation of CMS relative to Accra (where most CMS senior staff live) leads to inconsistent attendance and performance and a lack of regular supervision
- lack of consistent supervision and staffing at CMS leads to poor communications and less than optimal service to regional medical stores and teaching hospitals This combines with transport difficulties to make it impossible to maintain a consistent flow of drugs to the regions and districts
- there is a lack of human resources, in that there are few pharmacists or managers in the system who have training in quantification or management of pharmaceutical systems, or who have the background to develop management systems and work with computers to improve information flow

The MoH system for drug procurement is still officially centralized, with all drugs purchased through the CMS system As demonstrated in the data from the June '93 regional survey, in practice regions and health facilities are already decentralizing and purchasing in the private sector when CMS cannot respond (and perhaps in some cases, without attempting to use CMS)

The problem is that the MoH has started a chain of non-profit businesses - the Cash and Carry Programme - which is nominally run by a central office which moves too slowly and has too little information to manage the program effectively Communication and transport difficulties may make it impossible to salvage a system where all decisions on procurement and distribution are made centrally, since the clients have the ability to vote with cash, and purchase from the most reliable supplier, whether or not it is CMS

Previous reports have described the problems at CMS, and in spite of the various recommendations (and a change in the management structure overseeing CMS) service has apparently not improved much. Further, since CMS provides no delivery service, it is really just a rather inaccessible storage depot and additional cost center, which makes drugs more expensive to patients than necessary, if distribution can be managed without CMS. It may well be possible to take CMS completely or mostly out of the distribution loop for drugs while improving service to facilities. CMS would be retained to manage the distribution of consumables and equipment.

The Ministry of Health needs to determine to what extent the system for purchasing and distributing drugs can be centralized and possibly privatized. This report presents data which will be useful in making the decision, but the RPM assessment was not intended to provide a definitive answer to the problem. It is probable that the "privatization" study which the Ministry has requested from Holland could provide the necessary information if it is properly targeted.

Given the current shortage of persons with a strong background in drug supply management, it does seem likely technical assistance would be useful, no matter what structure is chosen for the supply system. Once a decision has been reached concerning the future shape of the logistics system, decisions can be made concerning the nature and level of technical assistance the MoH may need to make the system functional.

The findings of the RPM survey make it obvious that a revised policy on pricing and markups at each level of the Cash and Carry system is urgently needed. The 1992 MoH policy called for 25% markup at CMS, 0% at RMS, and 5% at the facility level, this policy was not followed either at CMS or in the five regions surveyed. As discussed in Section 2.1, the MoH does not have enough information to know what markups are needed at each level, and whether or not the various revolving funds are de-capitalizing. Our findings suggest that few facilities are following official pricing policy, with each facility pursuing its own procedures. About half of the facilities surveyed seem to be de-capitalizing. Also, since the transport problem is in large part related to financial shortages, some consideration should be given to covering drug transport costs in the Cash and Carry program, none of the facilities now attempt to cover transport costs in selling prices.

The Ministry of Health now purchases drugs through a single annual tender, which makes accurate estimation of needs critical, this quantification process has not been reliable in the past few years, leading to overstocks of some items and stock-outs and "emergency" purchases of others. The Ministry has made the decision that quantification of drug needs for procurement will be done at the district and sub-district level, feeding information to the regions, and then to the central ministry for the next tender. Our observations suggest that if this is done without proper training, the results of the quantification will not be any better than those in recent years. The potential exists to use the regional Cash and Carry Coordinators as resources to help districts and regions prepare their estimates, but these staff would need training, and ideally access to computers, since assembling an accurate compilation of district and regional data manually would be cumbersome and time consuming.

Lack of regular reports on consumption at regional medical stores and CMS hampers effective planning. The system of manual reports described in the Cash and Carry operations manual could provide necessary information on consumption at health facilities, but this will only be useful if the information is compiled by district and region to assist in planning. Manual record systems can effectively manage stock at health facilities, but warehouses such as CMS and RMS need computer systems to compile information on consumption by all the health facilities and to generate reports to support effective management decisions.

PRIORITIZED RECOMMENDATIONS

We suggest the following activities:

- 1 Study to determine the future structure of the MoH drug supply system
- 2 Development of pricing policy
- 3 Development of decentralized needs quantification and prioritization
- 4 Installation of inventory management software, and intermittent technical assistance to regional medical stores and MoH in supply management

1 Study to determine the future structure of the MoH drug supply system

Based on our observations, we do not believe that the Central Medical Stores is likely to become functional barring radical change in structure, personnel, and perhaps location. When CMS is not functional, it is an unnecessary cost layer in the Cash and Carry System which increases prices to patients without providing a corresponding benefit.

There are several alternatives to the current distribution system. Any of the options below could work if committed people are involved, none will if staff and management are not committed. The key is that people must be made responsible for performance, just as in a business, since the Cash and Carry programmes are in fact small businesses.

We think that the least disruptive and perhaps most effective way to improve the Ghana drug supply system would be to change to a system whereby local tenders are negotiated by the Ministry of Health and Ghana Supply Commission. The system would use estimates (not guarantees) from the districts and regions, and regional medical stores and health facilities should be able to order tender drugs directly from the local suppliers. This system would work best if the local suppliers could deliver at least to regional stores, but since the regions and teaching hospitals must now come to Tema, their transport costs might not increase if they came to two or three suppliers in Accra. Assuming that local manufacturers and distributors could provide necessary services at a tender price similar to that charged under the current system, the cost layer for CMS would be avoided, reducing the price to regional stores and facilities.

The best system for managing drugs which must be ordered internationally is not clear, there are at least three potentially viable options

- Drugs could be ordered and supplied through Central Medical Stores, if the system can be adequately strengthened and if this is the most cost effective solution
- A local distributor could be selected through tender to warehouse and distribute drugs which are purchased internationally, for a management fee
- Tenders could be solicited from local suppliers for all drugs, with internationally manufactured drugs purchased from the most cost effective local source

Another possibility is establishing a "parastatal" which would manage all drug supplies in a manner similar to, but hopefully more effectively than, the current Central Medical Stores. Also, the International Trade Centre (ITC) study in 1990 suggested an expatriate management team for Central Medical Stores, with training of local staff and eventual turnover, this would probably improve CMS operations (at least in the short term), but this model has not been uniformly successful in producing sustainable reforms in other countries. It also begs the question of whether or not CMS is needed, in light of the Cash and Carry Programme.

We believe that some combination of the above options would be more cost-effective than total privatization of outpatient services, assuming that the Ministry of Health (or other Ministry) would be responsible for covering costs of exempt patients, including MoH staff and other civil servants under the privatization scheme. If the Government is not responsible for those costs, privatization of outpatient services might be viable assuming that patients can afford to pay the private sector charges.

The Ministry of Health has approached the government of the Netherlands to support a study of options for decentralizing or privatizing the drug supply system. We suggest that the Ministry of Health should proceed with the proposed study (whether or not the Government of Holland ultimately supports the study). We suggest that the following topics should be addressed in the study:

- A. Is Central Medical Stores a necessary part of the drug supply system?
- What is the actual operating cost of CMS, and how does this compare with private distribution alternatives?
 - Is it possible to strengthen the management and supervision at CMS, given its Tema location? What changes in the system would be required?
 - Could CMS perform more reliably if its role were limited?
 - What level of staffing is really required to operate CMS effectively with the varying assumptions as to future role? Would the ITC proposal for interim management of the CMS by external advisors produce sustainable improvements?

- B What is the capacity of local manufacturers and distributors to provide service directly to regional stores and hospitals?
- Could they distribute directly to regions? Can they do this reliably in all seasons? Do they now have the necessary storage capacity and a reliable distribution network which could serve all regions more efficiently than is presently done through CMS?
 - Would it be feasible to change the tender process so that tenders are negotiated on estimated use, and regions and facilities order from suppliers as needed?
 - Would drug prices be close to those charged under the current centralized system, if regions and hospitals ordered directly? What would be the effect of changing from one large annual shipment to an "order as needed" system?
 - Can the manufacturers and distributors obtain necessary financing for continuity of service under a system where regions and hospitals order supplies as needed?
 - Are there local wholesale distributors who could manage Cash and Carry tender supplies on a "Prime Vendor" basis (taking total responsibility for stocking and distributing drugs from both local and international manufacturers)?
 - What is the cost-effectiveness of direct distribution?
- C How can the MoH improve drug transport to regions and health facilities?
- Can the distributors deliver directly to regions?
 - Should the cost of drug transport be included in drug prices to patients, so that funds for transport come from the Cash and Carry funds? What percentage would be needed to cover these costs, and should this be standard or individualized by region?
 - Are there other options, such as contracting for part or all of the distribution by private transporters? Could this be done for all regions and all seasons? How would this be financed?
- D What is the feasibility and desirability of developing a separate non-profit or quasi-governmental agency to manage MoH supply logistics on a business-like basis?
- Would this be more cost effective than CMS or direct distribution in terms of total recurrent costs at each level?
 - Could staffing and management problems which reduce the effectiveness of CMS be resolved in a parastatal?
 - What would be the costs (financial and other resources) involved in setting up a parastatal agency?
 - What real advantages, if any, would there be with a parastatal compared to the current CMS structure?

- E What are the cost and management implications of decentralization and expanded private sector roles in logistics?
- What are the preferred options from a cost standpoint? From a management standpoint?
 - Can effective monitoring systems be put in place to make sure that the private suppliers perform according to contract and do not abuse the system?
 - Can the regions, districts, and the MoH manage the payment process so that the private sector is persuaded to perform reliably?
 - Can the regional medical stores handle an expanded role in managing distribution? What would be needed in terms of staffing, equipment, and training? What would be the effect on recurrent costs?
 - Are the regional stores structurally adequate with the currently planned improvements, and if not, what additional work would be needed?
 - What policy changes are needed in the MoH to make each decentralization option work? How likely are these changes?
- F What is the feasibility and desirability of privatizing all out-patient pharmacy services?
- How will coverage be provided for patients who currently do not pay for drugs under Cash and Carry? These include exempt patients, civil servants and MoH staff, and paupers
 - If the MoH pays for these patients, what is the best arrangement?
 - Patient pays, reimbursed by government,
 - Direct reimbursement to pharmacy
 - Capitation
 - Fee for service
 - Other?
 - How will the MoH enforce use of the national formulary items, what are the cost implications if this is not enforced?
 - How will the MoH control costs and limit abuse by patients and providers? Issues which must be addressed are
 - Patient eligibility for services financed by Government
 - Prices charged by providers (options might be negotiated markups or maximum reimbursement prices)
 - Over-utilization by patients, excessive or irrational prescribing, and fraudulent billing (options could include drug use review, numeric or financial caps on services, and audits of service provider records)
 - Can the MoH manage the program with current management and information systems? If not, can necessary systems be put in place, such as identification cards for providers and patients, and a computerized tracking and review system?
 - Can the private sector provide continuous service in all areas?
 - Would total privatization be politically and socially acceptable, considering the potential impact on staff and patients?
 - Even if out-patient services were to be privatized, how would the logistics of in-patient drugs be managed and improved?

In order to do a thorough job, at least a three person team of external consultants, and at least three **full time** senior counterparts, would probably be required for a minimum of 4-5 weeks. The external consultants should have expertise in cost-effectiveness analysis, logistics and procurement management, and in developing public/private sector cooperation.

How the RPM Project Could Help

The RPM project and MSH drug management program could provide advisors to play a role in the study, assisting whatever team is selected by the Ministry of Health and the government of Holland

2 Development of pricing policy

Our review of the status of Cash and Carry revolving funds in five regional medical stores and twenty health facilities suggests that about half of these funds were probably de-capitalizing as of December 31, 1992, and that most of the rest were on uncertain ground. We found that there is no systematic approach to pricing, and that each health facility is pursuing its own course.

It is suggested that the Ministry of Health should convene a workshop on pricing policy. This workshop should be held as soon as it is practical, since the Cash and Carry programme can survive only if the pricing policies prevent the individual revolving funds from de-capitalizing. The limiting factor in organizing the workshop is the need to collect comprehensive information from the health facilities and medical stores (described below). This data collection would have to be complete to make the workshop worthwhile.

The workshop should consist of two phases, in the first phase (lasting three to four weeks), central, regional and district representatives should bring complete details on each of the Cash and Carry funds. This should include Central Medical Stores, each regional medical store, and each facility in the regions (presenting information compiled from Cash and Carry reports).

It is expected that at least two experienced advisors would be required, along with two local consultants, for the first phase of the workshop. Each advisor and consultant would need experience in computerized analysis of financial data and drug cost recovery programs, and the team would need access to at least five to six computers.

The following information should be analyzed

- Estimated percentage of low income patients, paupers, and patients in high risk health groups, served by the facility
- Stock Value at beginning of Cash and Carry
- Current stock value
- Beginning Cash and Carry fund balance
- Current Cash and Carry fund balance
- Total purchases since beginning of Cash and Carry
 - Purchases from CMS or RMS
 - Purchases from private sector
- Total cash sales revenue since beginning of Cash and Carry
- Total value of free drugs issued, broken down by
 - Issues to staff
 - Issues to other patients
 - Issues to other facilities
- Total owed by staff or facilities
 - Amount which is unlikely to be collected
- Estimated value of loss due to leakage, expiry, and other waste
- Estimated or actual cost of transport of drug supplies (including ancillary costs such as allowances)
- Estimated or actual cost of operating pharmaceutical facility (May be calculated using percentage of total facility costs)
 - Space cost, if any
 - Cost of consumable supplies
 - Cost of utilities
 - Cost of communications
 - Other direct costs
- Information on drug consumption and prices (For each drug in stock or the top 50 drugs in terms of volume)
 - Total consumption in past year
 - Last price from CMS or RMS and date
 - Last price from private sector and date
 - Current selling price
 - Selling price to patients in local private pharmacies

The working group should compile the above information, and use the compiled figures to determine the actual markups and margins now being achieved by CMS, by each RMS, and by each facility, and the current state of each revolving fund. The group should then determine what markup/margin would be required to cover replacement costs at each level, and what percentage would need to be added to cover transport costs and operating costs. This should be calculated in several different models, varying the assumptions, to determine which options are financially viable.

The proposed selling prices with each model should be compared with private sector prices in each region, they should also be evaluated against known information about patient's ability and willingness to pay, and the likely adverse impact if patients can't pay.

Comparative data and recommendations should be prepared for presentation to a policy workshop. The compiling of data and report preparation would take about one month after the end of the first phase of the workshop.

The second phase of the workshop should be a meeting of senior managers from the MoH, regions, and districts. Participants should include senior MoH staff, regional directors, district management, regional pharmacists and Cash and Carry coordinators, and any other officials who would provide valuable input into the pricing policy. This group would review the data and recommendations prepared by the working group, and determine what percentage of transport and operating costs should be covered in markups, and what pricing policies should be applied at each level of the system in order to sustain the Cash and Carry programme.

How the RPM Project Could Help

RPM could provide advisors to assist with both phases of the pricing policy workshop, bringing spreadsheet and database software tools to assist in compiling information and in producing analyses of options. RPM assistance would be contingent upon the **full time** availability of at least one counterpart from each region (probably regional Cash and Carry Coordinators) and at least one responsible MoH official, throughout the initial phase of the study.

3 Development of decentralized needs quantification and prioritization

Prior to the next tender cycle, training will be needed in quantification methods for those personnel in districts and regions who will be responsible for assembling needs projections, and for managers who will compile and analyze the estimates.

As noted in Section 2.1, we recommend that the regional Cash and Carry Coordinators should be used as primary resources in decentralizing quantification. Access to computers will be crucial if the regional coordinators are to successfully compile data from various districts and sub-districts in the region in any reasonable time frame. Similarly, it is very important that the MoH should have a senior staff member who has knowledge of quantification and access to a computer to compile data and prepare reports. This person should be responsible for managing the quantification process (after appropriate training), as well as establishing a procurement information system. We suggest the following sequence:

- The MoH should make sure that each regional coordinator, and the MoH staff who will be responsible for quantification, have access to computers that can handle modern spreadsheet and database software. This implies a 386 or 486 machine, with 80MB hard disk (or larger) and 4MB of RAM (or more). For the regional coordinators, the best machines would be portable computers, which operate both on battery or direct current (240v). Ancillary equipment should include access to a reliable dot-matrix or laser printer, and ideally each regional coordinator should be assigned a portable printer. Computers and ancillary equipment should be in hand and set up by December 31, 1993.

- January, 1994 Regional Cash and Carry Coordinators, central and regional medical stores staff, and MoH staff receive training from advisors in basic quantification methods using computers, along with training as trainers of other staff, this is done in a one week workshop. Local staff practice computer skills during interim between first and second workshops.
- February, 1994 A second one week workshop is held for RMS staff, MoH staff and regional coordinators to review lessons learned and to receive specific training in computer-based quantification, using spreadsheets and database tools, and in analyzing quantification results.

Then the actual 1994 quantification process should proceed

Stage 1 February/March, 1994 Districts compute tender requirements, based on the standard formula, and submit these requirements to the Regional Administration. Regional Cash and Carry Coordinators facilitate district quantification as needed.

Regional Medical Stores do a separate quantification, based on their records of issues to districts, these are used to cross check district estimates.

Teaching hospitals do their own quantification. MoH staff provide support as needed. MoH does a separate quantification, based on issues to clients.

Stage 2 April, 1994 Regions submit collated estimates of requirements to MoH. Teaching Hospitals submit estimates to MoH. Estimates from regions and hospitals are compiled by MoH staff.

Stage 3 May, 1994 The MoH officer responsible for quantification prepares a summary of estimates, comparing regional and Teaching Hospital with CMS figures, and submits this to the Procurement Committee and to Regional Administrators. He or she uses tools such as ABC and VEN analysis to compare requests with priorities, and to suggest modifications in quantities as appropriate.

Stage 4 May, 1994 The Procurement Committee determines quantities to tender, it is suggested that at least some regional representation be present for this process.

The primary danger is that compilation and collation could take so much time that the numbers are no longer relevant by the time the process is complete, this has certainly happened in other countries. However, if the suggested computerization and training can be provided, the delay can be minimized. If there is significant delay, this should be built into the re-order formula for future years, most easily by increasing the procurement period by the number of months needed for quantification.

How the RPM Project Could Help

RPM could provide technical assistance for the various stages of the quantification process, as part of a long-term technical assistance program. RPM could provide external and local advisors, along with spreadsheet quantification models used in Nigeria, Zimbabwe and the Eastern Caribbean, along with the database program DEM, which quantifies drug requirements based on both past consumption and morbidity patterns (and compares the results). RPM could also work to develop local capacity to maintain and support computer quantification models used, and could assist with 1995 and 1996 quantifications as well.

RPM assistance would be contingent upon the full participation of regional Cash and Carry Coordinators, RMS staff, and at least one MoH staff member who would be responsible for compiling and checking quantification results.

4 Installation of inventory management software, and intermittent technical assistance to regional medical stores and MoH in supply management

If the CMS is retained in the drug distribution system in any role, a network compatible inventory management program should be installed (since network hardware and a Novell operating system have already been purchased). If regional medical stores are to play a pivotal role in drug distribution of drugs and consumables, their inventory management systems should be computerized. The inventory management programs for RMS would not need to be network compatible, but would need to be able to communicate with a system installed at CMS.

CMS has adequate hardware in place, each regional medical store would need the following minimum hardware:

- 386 or 486 DOS compatible computer, with at least 4MB RAM and 200MB hard disk and two floppy drives (5 25" and 3 5")
- VGA color monitor
- Dot matrix or laser printer
- Uninterrupted power supply and surge protectors
- Small generator in stores which do not have reliable power (if any)

Ghana should attempt to find inventory management software which has already been developed and tested, either through donors or commercial purchase. Many developing countries have now installed computers and inventory management systems in their medical stores, and one of these systems should be suitable for Ghana. It is not recommended that Ghana develop its own software program, this is not because it cannot be done, but because the time required to develop, test and debug an adequate program is long, and (in most cases) involves many problems along the way.

As noted, there are tested inventory systems which could be made available for little or no cost to the government, given the opportunities for donor participation. These systems could be installed in Ghana quickly, this may be preferable to purchasing a commercial system, but this is true only if arrangements are made for local support of the system in the future.

How the RPM Project Could Help

The RPM project could provide inventory management software and support for installation, training and follow-up over a two to three year period. We suggest that these activities would be best focussed at the regional medical stores, since they should be computerized no matter what structure is selected for the system (other than total privatization)

RPM could install the INVEC inventory system in regional medical stores, and could also provide the INVEC multi-user version for use at CMS, if CMS retains a distribution role in the drug supply system. RPM assistance would be contingent upon the availability of dedicated counterparts at each site where INVEC would be installed, in order to assure the sustainability of the systems which are installed. Counterparts would be responsible for preparing data in advance of RPM installation visits.

All RMS installations could be completed in one calendar year, with periodic support visits over the two following years (two to three per year). A local firm would be located to participate in INVEC installation and support, so that the system can be supported after RPM assistance ends, RPM could support the cost of the local firm during RPM technical assistance, but the Ministry would need to develop a contract for software support thereafter. The Ministry should also develop a contract with a local computer firm to support computer hardware at central and regional medical stores.

POTENTIAL LOCAL COLLABORATORS AND COUNTERPARTS

We have not yet located any firms in Ghana which would be suitable as collaborating institutions in supply management and support of inventory management software. This does not mean that there are no individuals or firms who could provide the needed services, we know that there are software firms in Ghana who could potentially support INVEC. The Centre for Tropical Clinical Pharmacology, at the University of Ghana Medical School, and the Ghana INRUD Group could provide assistance in developing and implementing quantification and management information systems, and in facilitating pricing and quantification workshops.

Of greater concern is the potential lack of sustained availability of Ministry of Health counterparts. Based on our experience during this assessment, it is unclear that the Ministry can regularly provide senior counterparts who have the time and interest to participate fully in technical activities. If such participation cannot be assured, RPM would hesitate to become involved in technical assistance to the drug supply system, because there would be little chance of sustaining improvements which were made solely by RPM advisors.

The most promising prospects as counterparts to possible RPM activity in this technical area may be the pharmacists who coordinate the Cash and Carry Programme, for that reason, it may be preferable to focus any RPM technical activities in procurement/inventory management at the regional level.

POTENTIAL CONSTRAINTS AND MINISTRY ACTION NEEDED

The government must determine what structure in the drug supply system will best serve the needs of Ghana, we suggest that the 'privatization' study be done before a decision is made, but a decision should be made before the supply system (and any RPM technical assistance to the system) can go forward.

The major constraint which may hinder implementation of changes and reforms in the system is the need for more trained and motivated staff in the supply system. As noted, if reliable and interested counterparts are not available, no technical assistance program can succeed.

Since the Ministry is still evaluating options, it is unclear whether RPM technical assistance is needed, and if so, what sort of assistance is wanted. The Ministry would need to determine what involvement by RPM is needed, and discuss its wishes with USAID and RPM.

Before the RPM project could consider working in this technical area in Ghana, the Ministry and RPM would need to agree on a specific workplan, the scope of which would be governed by the availability of counterparts to participate fully in developing and implementing the workplan.

DRUG REGISTRATION

SUMMARY OF GAPS RELEVANT TO RPM TECHNICAL AREAS

The Ghana Pharmacy Board currently uses a manual system to track registered products, this system does not lend itself to ready retrieval of information on registered products. The Pharmacy Board is interested in a computerized system, and has (or will soon have) computer equipment on which a registration system could be installed. None of the Pharmacy Board staff have computer training (although Mr. Annan of CMS is expected to be a resource), and there has been no evaluation of what sorts of software should be installed or the options for obtaining such software. Some staff of the Pharmacy Board have attended computer appreciation courses and have also been introduced to the WHO/PAHO drug registration software.

The Pharmacy Board needs, but does not now have, access to an extensive base of information that would facilitate the review of drug applications made by manufacturers. Theoretically, this would mean access to the entire primary base of medical literature for all drugs being considered. In addition, for those drugs approved (registered), continuing monitoring of the literature for clinically-relevant changes in the information base supporting any particular drug would be necessary. Practically, with limited resources this might mean reliance on secondary or tertiary references that can be considered to be current, accurate, clinically relevant, peer-reviewed, and as free of biases as possible. One way to do this would be to improve access to electronic drug information data bases.

Currently, it is the pharmaceutical product that is approved/registered by the Pharmacy Board and not the specific indications of the drug substance. Therefore, there is no such thing as an "approved indication" in Ghana. This means that manufacturers can market their products for, and prescribers can use, a registered product for whatever indication that comes to their attention. Although the Pharmacy Board has approved a new drug registration application form that requires the manufacturer to specify which indications are being applied for, this is yet to be effected. When a product is approved no formal Pharmacy Board announcement is made. This leaves it to the product's manufacturer to let prescribers and dispensers know of new product approval. Unless the Pharmacy Board has very effective marketplace and product monitoring, the potential for the marketing of unregistered products would seem to be relatively high.

A revised Food and Drugs law was passed in January 1993, but it has yet to be published and made official. The law would establish an agency similar in concept to the USFDA, with two branches, one dealing with drugs and the other with food. The legislative document addresses all of the relevant areas, and will be a step forward in most respects when it is put into effect. The problem is that while the legislation is complete, the labor intensive portion of the work, developing the implementing regulations, still remains to be done.

PRIORITIZED RECOMMENDATIONS

The following activities are suggested in Drug Registration

- 1 Select, adapt and install drug registration software
- 2 Develop and install an electronic data base of drug information to assist in reviewing products which are put forward for registration
- 3 Develop implementing regulations for new Food and Drugs law

1 Select, adapt and install drug registration software

The Ministry of Health should make arrangements to install drug registration software at the Pharmacy Board. The WHO Drug Management and Policy Division, working with the Pan American Health Organization MIS Division, has developed drug registration software which may meet Ghana's needs with some adaptation and modification. WHO and PAHO do not now have staff and funding to install their software in Ghana, but Ghana could obtain a copy of the software for evaluation and use on request. The following steps are suggested

Needs assessment

Determine exact software requirements, considering documents used, information flow, and skills and support available in Ghana. Determine what changes in staffing patterns (if any) would be needed to sustain a computerized registration system. Obtain a copy of the WHO/PAHO software, and determine what adaptations would be needed to meet Ghana requirements, and whether such adaptations are feasible, or whether custom software should be developed. An external advisor could facilitate this process.

Software selection and adaptation

Adapt or develop software, a local firm should be chosen to participate in this process, along with the external advisor(s).

Software installation

Install software and load Ghana data into system. The loading process could require recruitment of temporary data entry personnel, to avoid long delays, the current WHO/PAHO software would require 3-6 months to load the 1500+ products which are now registered.

Training

Provide training for Pharmacy Board personnel in use of the system, this would require 1-2 weeks at the time of installation. Additional training should be provided at least semi-annually during the first 2-3 years of system operation.

Arrange for support for the software and hardware

External advisors should work with a local firm during adaptation (or development) and installation of software. Contracts should be negotiated with local firms to support both hardware and software over time, ideally, these would be the same firms which support inventory management software and hardware.

How the RPM Project Could Help

RPM could provide advisors to help with each of the above steps, and could assist Ghana in selecting, obtaining, adapting and installing registration software. RPM could also support the cost of a local collaborating firm to help during installation, training and support of the system over a 2-3 year period.

2 Develop and install an electronic database of drug information to assist in reviewing products which are put forward for registration

Access to current drug information is needed to assure that product registration applications are properly reviewed by the Pharmacy Board. Given the recurrent expense of maintaining a library of medical journals and texts, it is suggested that once a drug registration system is installed, an electronic database of drug information should be made available on the computer system. This could be done either through CD-ROM technology, or by hook-up to an international service providing access to medical/drug information databases by modem. The CD-ROM option would probably be more cost-effective. Once information management capacity is in place at the Pharmacy Board, the Board should develop and implement system for informing Ghanaian physicians and pharmacists about new product approval and new product information. Information could be provided through regular meetings or through regular cooperative announcements in widely distributed professional journals (eg *Ghana Medical Journal*, *Ghana Pharmaceutical Journal* and the *Health Courier*).

The information system should also be used to consider which indications should be approved when a drug is registered in Ghana.

How the RPM Project Could Help

RPM could provide access to a CD-ROM drive, along with access to the USP drug information database (USP DI), in CD-ROM format. This database has pharmacological information as well as information on approved indications in the U.S. and Canada. It also includes indications which are considered by experts to be medically appropriate, although the indications are not approved by U.S. or Canadian regulatory agencies. The new USP International Health Advisory Panel will be helping USP assemble information on internationally approved indications for drugs, which would also be made available in Ghana. RPM could also provide technical assistance to support the establishment of mechanisms to review and approve proposed indications for use of registered drug products and to produce information for review of new drug applications, as well as information on new products for physicians and pharmacists.

3 Development implementing regulations for new Food and Drugs law

It may be expedient to obtain assistance from external advisors when the time comes to develop regulations to implement the 1993 Food and Drugs law. Given the similarity between the new structure and the United States Food and Drug Administration (USFDA), it is suggested that the Ministry of Health consider requesting assistance from the FDA when the time comes to develop regulations.

How the RPM Project Could Help

RPM could facilitate the process of obtaining USFDA assistance to help develop regulations

POTENTIAL LOCAL COLLABORATORS AND COUNTERPARTS

As is the case with inventory software, we did not locate suitable local collaborating firms during the assessment, but are confident that firms and individuals can be located to help adapt, install, and support registration software. The Centre for Tropical Clinical Pharmacology, at the University of Ghana Medical School, and the Ghana INRUD Group could provide assistance in developing and implementing drug information systems.

Counterparts at the Pharmacy Board are definitely available for participation in analyzing software needs and options. It is less clear whether current staffing would support data entry on a routine basis after the system is installed, but the Registrar has assured RPM that personnel would be made available to operate the system once it is installed and operational.

POTENTIAL CONSTRAINTS AND MINISTRY ACTION NEEDED

In the case of drug registration software, there should be relatively few constraints, once the MoH has made the decision to proceed, assuming that appropriate advisors are made available and that the WHO/PAHO software design can be adapted to Ghana needs. The Pharmacy Board would need to put in a formal request for the software to Dr. Valerio Reggi, at the WHO Drug Management and Policy Division, in Geneva.

The USP DI data base can be readily installed on Pharmacy Board computers, and staff can be trained in use of the system, it is less clear how readily the Pharmacy Board will be able to adapt to new procedures. The Pharmacy Board managers and technical staff will need to spend the time needed to learn and use the new systems.

Progress can not be made on the new Food and Drugs law and on developing implementing regulations until the law has been published and put into effect. Assuming that agreement to proceed is reached within the Ghana government, the process of developing regulations should not have many unexpected constraints.

DRUG INFORMATION/RATIONAL DRUG USE

SUMMARY OF GAPS RELEVANT TO RPM TECHNICAL AREAS

The 1991 revision of the Ghana Essential Drugs List and National Formulary (EDL/NF) is still unpublished, and few copies of the 1988 edition are still available. Only 45% of health facilities visited in the regional survey had the 1988 National Formulary.

Practitioner access to important new drug information is limited in Ghana, as is the ability to easily seek out additional information through a referral network when such information is deemed necessary. This is true for both the public and private sectors. With the exception of the *Health Courier*, existing journals/bulletins going to physicians and pharmacists have irregular publication dates and cannot be relied upon to provide timely and current access to new information.

Most of the drug information provided to Ghanaian health care practitioners comes from the pharmaceutical industry. Whether this information takes the form of package inserts, entries in MIMS, advertisements, or face-to-face encounters, the potential for bias in this information must be kept in mind. The extent of this reliance on drug manufacturers underscores the importance of having an unbiased information resource such as the EDL/NF available. Delay in the printing of the revised edition (1991) exacerbates the problem, and the revision will soon be so outdated that all of the work will have been wasted.

No drug utilization or drug review studies are formally conducted by the MoH. Such activities are necessary to monitor the use of drugs and to learn where opportunities might exist for financial savings through changes in use patterns. They are also useful for training purposes and for the quantification of drug needs.

Data from the Regional Survey suggest over-prescribing (4.3 drugs/consultation) and overuse of injections and antibiotics. Over 80% of dispensed drugs were not adequately labelled.

Proper use of medication by the patient/consumer requires adequate knowledge and understanding of what, why and how it must be taken. Dispenser-consumer interaction time was very short in most of the observed instances, even less than one minute. Time and effort are required to appropriately communicate instructions for proper use.

The ability of a consumer to obtain prescription drugs outside of the legally recognized system is of concern. Inappropriate treatment and/or treatment periods, duplicative therapy, and adverse reactions or drug interactions are more likely to occur, and the potential exists for societal problems such as increased bacterial resistance to antibiotics.

PRIORITIZED RECOMMENDATIONS

The following activities are suggested in Drug Information/Rational Drug Use

- 1 Publication of the revised national formulary manual
- 2 Drug use review
- 3 Development of drug information resources
- 4 Drug information dissemination programs

1 Publication of the revised national formulary manual

It is recommended that the MoH update and publish the Essential Drugs List and National Formulary in pocketbook size as soon as possible. The Ministry of Health should ensure that enough copies are printed to cover workers, primarily physicians and pharmacists, at all health care facilities. There should also be enough copies for medical and pharmacy students in their last year of training. The revised Essential Drugs List and National Formulary may be sold at cost, or even a small markup. Medical and pharmacy students are already purchasing their textbooks (low-cost English editions) and they would certainly welcome the opportunity to obtain a copy for use, particularly during the clinical clerkships.

If the National Drug Committee cannot quickly update the 1991 information to reflect current information, the MoH could consider publishing the 1991 version of the EDL/NF. However, because two years have passed since the Essential Drugs List was last revised, although not adopted or implemented, prescribers may not consider the formulary as current without another review. The 1991 revision produced only a few changes, and it is likely that few changes would be required to bring the 1991 revision to 1993 currency.

The Ministry of Health, through the National Drug Committee and other interested parties, should consider preparing an edition of the Essential Drugs List and National Formulary that is appropriate to the needs and the level of training of primary care workers such as the Medical Assistants. There are examples of such simplified therapeutic formularies in certain countries of Central America.

The private sector practitioners have approached the Centre for Tropical Clinical Pharmacology for assistance in developing a private sector formulary manual, the MoH should participate in this process as it is feasible and appropriate.

How the RPM Project Could Help

The RPM project could assist the Ministry in identifying the best strategy to update and publish the revised National Essential Drugs List and Formulary Manual.

RPM could also assist the National Drug Committee in establishing the capability to revise and publish the EDL/NF on an ongoing basis. It could aid the MoH and/or the Centre for Tropical Clinical Pharmacology in developing formulary manuals for primary care workers and the Ghana private sector medical practitioners, as well as assist the Drug Committee and Formulary Committee in updating formulary manual information.

This RPM assistance could include providing hardware and software needed for desk-top publishing, along with training for MoH staff to use the technology

2 Drug use review

Given the overuse of drugs in general and antibiotics and injections in particular, which was identified in the regional survey, great potential for improved use of drugs and significant financial savings exists. Drug use studies should be undertaken to assess ongoing patterns of prescribing and identify areas for possible intervention, stressing effective, safe and cost effective prescribing. The MoH should also study the problem of access to prescription drugs outside of the legally established system and make recommendations for decreasing the likelihood of this occurrence.

The Ghana core group of the International Network for Rational Drug Use (INRUD) is based at Korle-Bu Teaching Hospital. INRUD in general and the Ghana INRUD group in particular are very active in assessing drug use patterns and in devising interventions to improve drug prescribing and use. The Ministry of Health should establish active linkages with INRUD to focus attention on drug utilization in MoH facilities.

A joint WHO-INRUD regional workshop on Rational Drug Use is being planned for Accra in the first quarter of 1994, it is recommended that the MoH attempt to find donor support to assure that a cross section of MoH physicians, pharmacists and planners participate in this regional workshop.

How the RPM Project Could Help

RPM could assist the MoH and the Ghana INRUD group in designing and carrying out drug use studies, and in interventions to change behavior based on those studies. RPM could provide computer technology to assist in the compilation and analysis of data from studies and interventions, and provide training to MoH and INRUD staff in use of analytical techniques and technology.

3 Development of drug information resources

The MoH should collaborate with the University of Ghana and/or the University of Science and Technology to establish a centralized drug information center that would be staffed specifically to provide referral support to the Ministry of Health, and other universities and training facilities, and health care practitioners. The center should be responsible for providing drug information services to universities, Ministry facilities and health providers, the Pharmacy Board, and to private sector practitioners. It could also provide other services to universities, such as assistance in setting up course work options relating to drug information development, evaluation, and dissemination.

The Ministry should also use the drug information center as a base for drug use review studies and interventions, and to provide training and continuing education programs/workshops that focus on drug information, rational use of drugs, and communications/management.

How the RPM Project Could Help

If necessary, RPM could assist the Ministry in selecting the optimal site for a drug information center. RPM could provide training in how to set up and manage a drug information centre, and how to select and obtain drug information resources. Workshops could be provided in interpretation and use of drug information materials, both literature and electronic data bases.

The RPM project could install computer hardware and CD-ROM technology, and train drug information centre staff in use of the equipment, and in use of the drug information data bases. RPM could assist the MoH and the University of Ghana in developing and maintaining a drug information data base specific to the needs of Ghana. This would include establishing a multi-disciplinary Ghanaian advisory panel of experts to assist the drug information center in developing and revising drug information.

4 Drug information dissemination programs

Given the lack of ready access to information about drugs and their appropriate use, the MoH should consider establishing new mechanisms for drug information dissemination and developing educational programs/campaigns relating to communication and appropriate drug use. These programs should be considered for both health care professionals and consumers.

These programs may encompass the following types of activities/information:

- rational drug use interventions
- development of curricular components for medical, pharmacy and nursing education that relate to drug information, communications and patient education
- development of regular mechanisms, e.g., newsletters or columns in medical and pharmacy journals, to present new information about drugs, including new approvals, withdrawals, new side effects, counterfeiting or quality issues, cost/benefit information, etc
- develop public education campaigns relating to the appropriate use of drugs

How the RPM Project Could Help

The RPM project could provide training support for all of the suggested programs. In addition, hardware and software necessary for desktop publishing could be provided, as well as the training needed to implement a desktop publishing program.

POTENTIAL LOCAL COLLABORATORS AND COUNTERPARTS

There is clear potential for collaborative work with the School of Pharmacy at the University of Science and Technology (Kumasi), the Centre for Tropical Clinical Pharmacology at the University of Ghana Medical School, and with the Ghana INRUD group. These organizations would be valuable collaborators in any or all of the potential RPM technical assistance activities.

The Ministry of Health has not been active in drug information or drug utilization review, and it is not clear who effective counterparts might be. For consumer public education programs, however, the Health Education Unit of the MoH and the Ghana Health Students Association would be pivotal. The Cash and Carry Coordinators and District Health Management Teams would be likely counterparts in drug use studies and interventions.

POTENTIAL CONSTRAINTS AND MINISTRY ACTION NEEDED

The MoH would need to identify staff who have the interest and drive to work with advisors to develop and implement drug use review, rational use interventions, and drug information services. If suitable counterparts are not available, these technical activities would not have any sustained success.

The MoH would need to reactivate the National Drugs Committee to oversee the proposed technical activities, and the process of revising and publishing the National Essential Drugs List and Formulary Manual.

1.7 Next Steps in Exploring RPM Cooperation in Ghana

As already stated, the RPM project does not have core resources to provide all of the technical assistance mentioned in Section 1.6, nor is it yet clear that Ghana represents the best use of RPM core resources.

Four sorts of hurdles must be cleared before the RPM project could provide any assistance to Ghana:

- The Ministry of Health would need to determine that the assistance available from RPM matches needs in the drug system, and that the Ministry could provide counterparts to work with RPM advisors.
- The RPM project would need to recommend to USAID that long term technical assistance be provided in Ghana, based on the results of RPM country assessments and the conclusion that Ghana presents the best opportunity for impact with the resources available.
- USAID R&D Health would have to agree that RPM activities in Ghana would fall within the mission of RPM, USAID-Ghana would need to concur with the proposed activities.
- The Ministry of Health, RPM and USAID would need to agree on which of the possible technical activities should be selected, and a workplan would need to be developed, along with agreements with local collaborating organizations.

Once the Ministry of Health has reviewed and made any comments or revisions to the assessment report, the Ministry can determine whether it deems RPM technical assistance useful, given the limits on the sorts of assistance available and the conditions attached. The Ministry would also determine whether such assistance would receive concurrence from the USAID mission. One issue which affects the feasibility of RPM work in Ghana is the fact that USAID Ghana does not have the financial or staffing resources to divert attention to the pharmaceutical sector, their support would likely be contingent upon iron-clad assurances that there would be no adverse impact on their current portfolio of activities, and no diversion of Mission attention and resources to support RPM activities.

It is suggested that the Ministry of Health should consider the suggestions, get clarification if needed, and determine what sorts of RPM assistance (if any) would be useful. If any of the proposed RPM activities are deemed necessary, the Ministry should discuss the proposed activity with USAID Ghana. In the meantime, RPM will have completed most of the other country assessments, and will have more information on which to base the prioritization of opportunities for technical work.

Once Ministry of Health and USAID interests and priorities are clear, a senior RPM project representative can visit Ghana (if warranted) to discuss opportunities and technical activities. Based on the proposed scope of technical assistance activities, RPM would then recruit local organizations to collaborate in providing technical assistance, specific workplans would be developed at this time to correspond with the activities which have been agreed upon.

SECTION TWO - FINDINGS OF THE GHANA ASSESSMENT

2.1 Public Sector Drug Supply System

Background Information

The poor performance of the Ghana MoH drug logistics system in general and the CMS in particular has been a matter of some concern for several years to MoH, and has been an issue at each of the Cash and Carry workshops. The most thorough recent study of supply system function was done by the International Trade Centre (ITC), from Geneva. This study involved two components (materials management and procurement/supplies management), and it took place over a five month period (November 1989-May 1990). The study reported the following problems at CMS (and in the MoH logistics system)

- lack of supervision at all levels
- basic problems with housekeeping and cleaning
- no effective stock control system
- errors between ledgers and tally cards
- no reconciliation of errors
- no formal policies or procedures
- lax document control
- items distributed regardless of need
- no coding system or stores catalogue
- delays in processing documents
- no historic record of past consumption
- serious lack of manpower and training in supply management
- weak management skills
- poor inter-organization relationships
- inability to produce accurate budget estimates
- inconsistent supply of funds
- absence of long term planning

ITC made several recommendations for change, including the establishment of a Division of Purchasing and Supply (which was done), and embarking on a long term technical assistance project with full time ITC advisors managing CMS, and eventual turnover to MoH managers (which was not done)

The RPM/MoH assessment found that many of these problems still exist in the drug supply system, the RPM assessment team focussed on three primary areas of the drug supply system

- Finance and cost recovery
- Procurement
- Logistics and distribution

Findings are presented in Sections 2 1 B, 2 1 C, and 2 1 D , followed by our recommendations for the drug supply system in Section 2 1 E

Structure and Organization of the Drug Supply System

The Ghana public sector drug supply system is nominally centralized, in that the central Ministry of Health is responsible for conducting the annual procurement of drugs, for managing distribution through the Central Medical Stores (CMS), and for setting pricing policy for the Cash and Carry Programme. According to policy, all drugs are purchased through the annual tender, received at CMS, distributed from CMS to Regional Medical Stores (RMS), and from RMS to health facilities. The two teaching hospitals order directly from CMS.

The Minister of Health and Deputy Minister manage the Ministry of Health. The rest of Ministry management structure is currently in flux, due in part to the 1992 mandate to form a National Health Service, which has not yet occurred, and in part to administrative re-structuring, which is still in process.

Prior to restructuring, the Director of Medical Services managed Technical Operations, with directors of technical divisions such as pharmacy reporting to him. MoH administrative and financial activities were managed by the Chief Director, this office has traditionally been charged with managing financial affairs, and has been the most powerful position in the Ministry (having been the only "spending officer" with the power to commit Ministry funds).

Under restructuring, the Ministry technical and administrative management functions will come under the Director General of Health Services, managing five new divisions, each headed by a director (and each of whom would have "spending officer" status). The former office of the Chief Director has been changed to the Director of the Office of the Minister. The new divisions are:

- Technical coordination and research
- Policy, planning, monitoring and evaluation
- Human resource development
- Accounts and administration
- Stores, supplies and drug management

The WHO Strengthening Health Services division has been assisting the Ministry with the re-organization process, there are still issues of relative authority to be worked out, and it is unclear at this point what the final division of management responsibility will be. Apparently, some of the new position titles (such as Director General) have not been confirmed as of the time of the assessment.

The Ministry of Health has decided to decentralize much of the health services management authority to the regional administrations, and in fact expects to center basic management at the district and sub-district, in health management teams.

The MoH formerly had a National Drugs Committee which advised the Ministry on drug management issues and which produced the National Essential Drugs List and National Formulary, this committee has apparently been inactive since 1991.

Two current standing committees are important to the drug supply system, one is the **Standing Committee on Drug Management**. This committee is charged with solving problems in drug management and working on quantification and problems related to the Cash and Carry Programme. Members shown below (titles according to old MoH structure)

- Dr Adibo (Director of Medical Services)
- Dr Asamoah-Baah (Director of Planning)
- Dr Tinorgah (Director of Donor Coordination)
- Colonel Awuku (Director of Supply and Procurement)
- Mr Botchway (Director of Pharmacy Services)
- Mr Boateng (CMS Pharmacist)
- Mr Adams (Greater Accra Cash and Carry Coordinator)
- Dr Ofori-Adjɛi (Director, Centre for Tropical Clinical Pharmacology)

The second critical committee is the **Procurement Committee**, the committee has nine members (listed in the section on procurement below). This committee has recently taken total control of central drug procurement in the MoH, which makes it more difficult for one person to purchase drugs inappropriately. This had been a problem in the past, according to reports.

The Cash and Carry Programme was implemented nationwide in 1992, this is a system of pharmaceutical cost recovery and revolving drug funds, managed separately at each warehouse and health facility. Since Cash and Carry came on stream there has been no government budget support for drug procurement, with all funds for procurement coming from the C & C revolving funds. This has led to less central control of procurement, since regional medical stores and individual health facilities have the ability to purchase directly from the private sector, using their Cash and Carry funds. In theory these purchases are not supposed to occur without specific approval from the MoH, but communications are difficult between the MoH and the regions, and purchases are made from the private sector without waiting for approval.

The Ministry is now in the process of determining what the future structure of the drug supply system should be, the current system has not functioned well in the past several years, and the Ministry believes that improving the drug supply system is one of the most important tasks at hand. There is some sentiment in the government of Ghana for total privatization of outpatient services, and there are others who would favor retaining services in the Ministry, but managing procurement and distribution on a decentralized basis.

The Ministry has contacted the government of the Netherlands to sponsor a study of options for decentralization and privatization of drug supply in the MoH. This RPM assessment documents many of the problems which need attention, and should help to define the options which should be considered in the upcoming "privatization" study which is planned for later in 1993.

Finance and Cost Recovery

Structure of the Cash and Carry Programme

Separate revolving (Cash and Carry) funds are maintained by the Ministry of Health for Central Medical Stores, by each regional administration (for regional medical stores) and by each health facility, which purchase from CMS and RMS (and the private sector, as will be seen)

By MoH policy, Cash and Carry revolving funds can be used only for the purchase of drugs, and not for other institutional or MoH purposes. For example, they cannot be used for fuel for transport or for out of station allowances when picking up drugs. Reportedly, there have been instances where individual facilities spent Cash and Carry funds for non-approved purposes, but none of the facilities included in our survey reported this problem.

Each region and facility has control of its own fund, a designated "spending officer" must sign all checks drawn on the revolving fund. The Ministry has attempted unsuccessfully to set pricing policy, as will be seen below, each facility pursues its own pricing procedures. In reality each facility can be considered a separate non-profit business, and therefore, needs to operate on a businesslike basis in order to survive.

There is no discrete national management structure for the Cash and Carry Programme, each region has a pharmacist who is appointed as regional Cash and Carry Coordinator, and the Greater Accra regional coordinator has served as de-facto national Programme Coordinator, but in fact none of the regional coordinators have specific authority to supervise staff or to commit or manage funds. Each facility is expected to prepare monthly reports on stock consumption and balance, and on revenue and expenses, these reports are forwarded to regional administration, but are not sent to the central MoH. Thus, there is little information at the Ministry on Cash and Carry performance, and no mechanism exists to monitor the performance of the individual revolving funds.

Methodology Used to Assess the Cash and Carry Programme

The Rational Pharmaceutical Management Project Ghana assessment was not designed or intended to do an in-depth financial analysis of the Cash and Carry Programme, and information was not collected (or readily available) to allow such an analysis.

However, given the importance of the Cash and Carry Programme, we felt it was important to use the data which were available to assess the status of the revolving fund at the regional stores and facilities which were visited during the regional survey.

In the U.S. setting standard ratios and comparisons would normally be used to assess operating performance of the pharmacy component of health organizations. (A discussion of standard assessment ratios is found in Rakich, J., Longest, B. and Darr, K. *Managing Health Services Organizations*. Philadelphia: W.B. Saunders, 1985, 322-326)

The following standard ratios are relevant to pharmaceutical cost recovery and revolving drug funds

- Net sales to working capital - the total sales, minus bad-debt write-offs, divided by working capital
- Net sales to inventory - sometimes called "inventory turnover," the total sales, minus write-offs, divided by the value of the inventory
- Inventory shrinkage - the sum of beginning inventory value plus purchases, minus the sum of cost of goods sold, plus ending inventory value
- Operating margin on total sales - the value of total sales, minus the cost of goods sold, divided by the total sales. The cost of goods sold is not the same as total purchases, but is rather the purchase cost of the items issued. Margin is not the same as markup, as will be discussed below
- Average collection period of receivables - net accounts receivable divided by the average daily operating revenue

There are many additional standard financial ratios, which are used to evaluate the solvency of health care organizations, but which would not be applicable in a situation such as the Cash and Carry Programme. This is because operating costs are not covered in the cost recovery program, and the information on operating costs, value of assets, depreciation, accounts payable and adjustments for uncollectible accounts is not tracked or reported for separate revolving funds.

The following information would be needed to apply standard ratios and to determine with total confidence the financial performance of each of the Cash and Carry revolving drug funds

- Beginning and ending revolving fund balance for the fiscal year
- Beginning and ending inventory value for the fiscal year
- Value of total purchases and total sales
- Value of cost of goods sold
- Value of any donations received or stock returns from clients
- Value of any other expenditures from or charges to the fund
- Value of expired and/or wasted stock removed during the year and remaining in stock
- Value of accounts receivable from patients and from other facilities
- Value of bad-debt writeoffs

Much of this information could not be obtained in the context of the RPM survey

For Central Medical Stores, the only financial information available was the value of purchases, value of issues, and total revenue received (from the 1992 MoH annual report)

From the regional survey, we obtained the following information

- Cash and Carry fund balance as of December 31, 1992
- Total drug purchases
- Total revenue from drug sales
- Outstanding accounts receivable (for RMS only)
- Value of free issues to patients and staff
- Average inventory variation (by quantity in stock, rather than by value, for a set of twenty-one tracer drugs)
- Gross markup on last purchase price for the set of tracer drugs

Using this information, we made inferences regarding the status of the revolving drug funds as follows

- 1 The apparent adequacy of pricing policy, comparing actual markups for tracer drugs against a pricing model which illustrates the price needed to re-purchase the quantity issued of the local and international source drugs
- 2 The apparent status of the revolving drug fund, considering the adequacy of pricing, and the revolving fund balance compared to the value of purchases and issues

Our findings and analysis are presented in the remainder of this section of the report. Although the analysis is indirect, we believe the information assembled provides a reasonable picture of the financial status of the Cash and Carry revolving funds at the Regional Medical Stores and health facilities included in the survey.

Pricing Policy Issues and Revenue Goals

Most developing countries which have pharmaceutical cost recovery attempt to cover only a portion of full replacement cost, and use recurrent budget to make up the difference between cost and revenue. The rationale for partial cost recovery is usually equity - the perceived need to minimize the impact on the poorest and sickest portion of the population.

The stated goal of the Ghana Cash and Carry Programme is to sustain revolving drug funds at each medical store and each health facility. The goal is to recover the full costs of repurchasing the same quantity of drugs which were sold at each level of the system. Since the nation-wide implementation of Cash and Carry, no supplementary funds have been provided from the recurrent budget for drug purchases, so Cash and Carry Revenue must be adequate to cover re-purchase costs for all drugs (except for the nominal donations received by some individual health facilities).

In order to meet this goal, when setting a sale price (from CMS to RMS or RMS to Facility or Facility to Patient), the base sale price must be the expected next cost price for the entire quantity of drugs to be purchased, with any handling costs added to this base.

There are several additional costs which should be considered when setting drug sales prices

- The cost of drugs issued free to exempt patients and staff
- Losses from drugs issued to patients or facilities which do not pay
- Wastage due to expiry

Other additional costs which may be incorporated into the sales price include

- Transport costs for delivering or collecting drugs
- Salary and other operating costs

No matter how costs are identified and incorporated (or not incorporated) into the sales price of drugs, the overall markup or margin in each store or facility must be such that the average sales price of all drugs in stock equals the average next purchase cost for all of those drugs. If this is not achieved, the fund will inevitably de-capitalize, unless the government provides budget support to make up the shortfall.

Drug prices can be computed on the basis of markup or margin, the following table illustrates the difference between markup and margin, for illustrative purposes the base cost of the item is shown as 100 (any currency), and the markup and margin percentages are 25%

Method of Computation	Sample Calculation (Base cost 100)	Sale price	Net Revenue
Markup = 25%			
Cost multiplied by (1 + markup %)	100×1.25	125	25
Margin = 25%			
Cost divided by (1 - margin %)	$100 \div 0.75$	133	33

Commercial businesses are primarily concerned about the margin on sales, because this is the amount left to cover costs, including price inflation, after product costs are deducted. The real attraction of using margin as the basis for computing prices is that a lower percentage margin can be used to gain the same revenue, which may be more acceptable to clients and patients.

Whether using markup or margin, an organization can apply a simple average, with the same percentage applied to all products, or a variable markup (or margin) with different markups on different classes of drugs.

Likewise, when measuring existing markups or margins, one can consider either simple average or weighted averages. The weighted average is the overall markup or margin for all drugs considered relative to the total consumption (or sales). In order to achieve replacement costs for all drugs, the weighted average markup or margin is the critical issue. This must be monitored closely when attempting to use a variable markup strategy.

The questions of equity and price elasticity must also be considered - how much can be charged at each level of the system without driving patients/clients away from the system (and without having an inordinate impact on low income patients)? In some cases it may make no sense to attempt to charge for a certain drug, due to the availability of the drug at a much lower price from a competitor.

Each cost recovery program (or business of any kind) needs to consider all of the above issues when setting a pricing policy

1992 Cash and Carry Pricing Policy

The Ministry of Health is now using a simple average markup, rather than margin, to compute official sales prices at each level at the system. Therefore, we will discuss only markup in discussing the performance of the Cash and Carry Programme to avoid confusion.

The Cash and Carry Programme apparently did not specifically address any of the additional cost factors such as wastage, free drugs or transport costs, nor did the Ministry construct a weighted average pricing model to determine what markups should be applied.

The MoH used the following pricing model for 1992

CMS sales price to RMS and Teaching Hospitals

Vendor invoice price, plus 10% markup for duty (imported drugs only), plus 25% for handling

RMS sales price to health facilities

CMS sales price, with no additional markup

Health facility price to patients

RMS sales price, plus 5% markup for facility costs

No separate MoH markups were developed for items purchased from the private sector by regional stores or health facilities, probably because it was not anticipated that there would be any significant volume of these purchases.

Pricing Model Tables

We have constructed a pricing model which demonstrates the weighted average markup which would be needed to achieve full replacement cost at each level of the system.

Three examples of the weighted average pricing model are shown on the three following pages, the following assumptions are made in the models:

- It is assumed that the "handling" markups are to cover losses due to wastage and expiry as well as losses due to free issues and defaults on credit sales (by RMS). Markups are not expected to cover transport or facility operating expenses. Each of these models assumes 12% local drug price inflation, 6% international drug price inflation, and 25% annual devaluation (these figures are based on the 1991, 1992 and 1993 tender prices, all of these may be higher in the future).
- The markup (or margin) required at each level is a weighted average requirement, if variable markups are used, the weighted average must total the model's projection in order to cover replacement costs.
- The minimum sale price at each level must be the expected next cost price for the entire quantity of drugs to be purchased, with any handling costs added to this base.

- It is assumed that all drugs are purchased through the MoH tender, for simplicity, this could give too low a suggested markup for drugs bought in the private sector, if price inflation is more than that seen in the CMS tender
- **Pricing Model One** uses 25% handling costs at CMS, 0% at RMS and 5% at the facilities, this was the official MoH policy in 1992 **Model Two** uses 10% at each level, which has been proposed for 1993 **Model Three** shows simple drug replacement cost with no markups at any level to cover losses

The pricing model logic can be used with any combination of markups, margins, and values of inflation, devaluation, procurement commission, or handling costs. The pricing model can also project the savings to patients if the cost layer for CMS were removed from the system.

PRICING MODEL ONE

COVERS REPLACEMENT COST AT EACH LEVEL (Any currency)

HANDLING COSTS ADDED	CMS	25%
	RMS	0%
	FACILITY	5%

Assumptions on added costs

Handling Costs		Procurement.		Inflation/Devaluation	
CMS	25%	Ghana Supply Com.	4%	Intl Inflation	6%
RMS	0%	Duty (Imports)	10%	Loc Inflation	12%
Facility	5%			Devaluaton	25%

Local Purchases

CMS	Invoice Price	4% G S C	25% Handling Cost	12% Local Inflation	CMS SALE PRICE	Markup On Invoice	Margin
Year 1	100	4	25	12	141	41%	29%
Year 2	112	4	28	13	158	41%	29%
Year 3	125	5	31	15	176	41%	29%
Year 4	140	6	35	17	197	41%	29%

RMS	Current CMS Price	Next CMS Price	0% Handling Cost	RMS SALE PRICE	Markup On CMS	Margin
Year 1	141	158	0	158	12%	11%
Year 2	158	176	0	176	12%	10%
Year 3	176	197	0	197	12%	11%

Facility	Current RMS Price	Next RMS Price	5% Handling Cost	FACILITY SALE PRICE	Markup On RMS	Margin
Year 1	158	176	8	184	17%	14%
Year 2	176	197	9	206	17%	15%

International Purchases

CMS	Invoice Price Local	4% G S C	10% Duty	25% Handling Cost	6% Intl Inflation	25% Devaluation	CMS SALE PRICE	Markup On Invoice	Margin on Sale Price
Year 1	100	4	10	25	6	25	170	70%	41%
Year 2	131	5	13	33	8	33	223	70%	41%
Year 3	172	7	17	43	10	43	292	70%	41%
Year 4	225	9	22	56	13	56	382	70%	41%

RMS	Current CMS Price	Next CMS Price	0% Handling Cost	RMS SALE PRICE	Markup On CMS	Margin
Year 1	170	223	0	223	31%	24%
Year 2	223	292	0	292	31%	24%
Year 3	292	382	0	382	31%	24%

Facility	RMS Price	Minimum Sale Price	5% Handling Cost	FACILITY SALE PRICE	Markup On RMS	Margin
Year 1	223	292	11	303	36%	26%
Year 2	292	382	15	397	36%	26%

PRICING MODEL TWO

COVERS REPLACEMENT COST AT EACH LEVEL (Any currency)

HANDLING COSTS ADDED	CMS	10%
	RMS	10%
	FACILITY	10%

Assumptions on added costs

Handling Costs		Procurement		Inflation/Devaluation	
CMS	10%	Ghana Supply Com	4%	Intl Inflation	6%
RMS	10%	Duty (Imports)	10%	Loc Inflation	12%
Facility	10%			Devaluaton	25%

Local Purchases

CMS	Invoice Price	4% G S C	10% Handling Cost	12% Local Inflation	CMS SALE PRICE	Markup On Invoice	Margin
Year 1	100	4	10	12	126	26%	21%
Year 2	112	4	11	13	141	26%	21%
Year 3	125	5	13	15	158	26%	21%
Year 4	140	6	14	17	176	26%	21%

RMS	Current CMS Price	Next CMS Price	10% Handling Cost	RMS SALE PRICE	Markup On CMS	Margin
Year 1	126	141	13	154	22%	18%
Year 2	141	158	14	172	22%	18%
Year 3	158	176	16	192	22%	18%

Facility	Current RMS Price	Next RMS Price	10% Handling Cost	FACILITY SALE PRICE	Markup On RMS	Margin
Year 1	154	172	15	187	22%	18%
Year 2	172	192	17	209	22%	18%

International Purchases

CMS	Invoice Price Local	4% G S C	10% Duty	10% Handling Cost	6% Intl Inflation	25% Devaluation	CMS SALE PRICE	Markup On Invoice	Margin on Sale Price
Year 1	100	4	10	10	6	25	155	55%	35%
Year 2	131	5	13	13	8	33	203	55%	35%
Year 3	172	7	17	17	10	43	266	55%	35%
Year 4	225	9	22	22	13	56	348	55%	35%

RMS	Current CMS Price	Next CMS Price	10% Handling Cost	RMS SALE PRICE	Markup On CMS	Margin
Year 1	155	203	16	219	41%	29%
Year 2	203	266	20	286	41%	29%
Year 3	266	348	27	375	41%	29%

Facility	RMS Price	Minimum Sale Price	10% Handling Cost	FACILITY SALE PRICE	Markup On RMS	Margin
Year 1	219	286	22	308	41%	29%
Year 2	286	375	29	404	41%	29%

PRICING MODEL THREE

COVERS REPLACEMENT COST AT EACH LEVEL (Any currency)

NO HANDLING COSTS ADDED	CMS	0%
	RMS	0%
	FACILITY	0%

Assumptions on added costs

Handling Costs		Procurement		Inflation/Devaluation	
CMS	0%	Ghana Supply Com	4%	Intl Inflation	6%
RMS	0%	Duty (Imports)	10%	Loc Inflation	12%
Facility	0%			Devaluaton	25%

Local Purchases

CMS	Invoice Price	4% G S C	0% Handling Cost	12% Local Inflation	CMS SALE PRICE	Markup On Invoice	Margin
Year 1	100	4	0	12	116	16%	14%
Year 2	112	4	0	13	130	16%	14%
Year 3	125	5	0	15	145	16%	14%
Year 4	140	6	0	17	162	16%	14%

RMS	Current CMS Price	Next CMS Price	0% Handling Cost	RMS SALE PRICE	Markup On CMS	Margin
Year 1	116	130	0	130	12%	11%
Year 2	130	145	0	145	12%	10%
Year 3	145	162	0	162	12%	11%

Facility	Current RMS Price	Next RMS Price	0% Handling Cost	FACILITY SALE PRICE	Markup On RMS	Margin
Year 1	130	145	0	145	12%	10%
Year 2	145	162	0	162	12%	11%

International Purchases

CMS	Invoice Pnce Local	4% G S C	10% Duty	0% Handling Cost	6% Intl Inflation	25% Devaluation	CMS SALE PRICE	Markup On Invoice	Margin on Sale Price
Year 1	100	4	10	0	6	25	145	45%	31%
Year 2	131	5	13	0	8	33	190	45%	31%
Year 3	172	7	17	0	10	43	249	45%	31%
Year 4	225	9	22	0	13	56	326	45%	31%

RMS	Current CMS Price	Next CMS Price	0% Handling Cost	RMS SALE PRICE	Markup On CMS	Margin
Year 1	145	190	0	190	31%	24%
Year 2	190	249	0	249	31%	24%
Year 3	249	326	0	326	31%	24%

Facility	RMS Price	Minimum Sale Price	0% Handling Cost	FACILITY SALE PRICE	Markup On RMS	Margin
Year 1	190	249	0	249	31%	24%
Year 2	249	326	0	326	31%	24%

Table of Actual Pricing Procedures - 1992

The table on the next page reports on actual pricing for the set of tracer drugs at CMS, and RMS and health facilities surveyed. The table shows actual 1992 average and weighted average markups at CMS, and the RMS and facilities in the regional survey, for the set of tracer drugs. The average markups were computed for the most recent cost price reported by the store or facility, whether CMS/RMS or the private sector. Weighted average markups were computed by multiplying the total consumption of tracer drugs by the last cost to get total cost, and by the current selling price to get total revenue. The difference between total revenue and total cost is used to compute the weighted average markup on the total volume of drugs sold.

The averages in the table apply only to the set of tracer drugs, for those tracer drugs which showed some consumption in 1992. The extrapolations are based on a limited sample, and the true weighted averages may or may not be the same for the entire stock in the facilities surveyed.

Also, there would likely be some variation between the last cost and the average cost for all stock, and potentially between the current price and the average selling price for all drugs sold. We did not have data to compute average cost and sale price for all purchases, but we believe the data presented is adequate to show trends concerning overall pricing policy and the percentage of replacement cost being recovered.

The data used to calculate actual markups on tracer drugs is found in annex V, "Procurement, Pricing and Stock Data."

Ghana Regional Survey

Average Markups vs Weighted Average Markups, 1992 Drugs

	Average Markup	Weighted Average Markup
Central Medical Stores	25.4%	14.8%
Regional Medical Stores		
Brong Ahafo	0.1%	0.0%
Greater Accra	-2.3%	4.4%
Northern	44.9%	28.4%
Volta	35.0%	31.2%
Western	20.6%	32.8%
Facilities		
Brong Ahafo		
Regional Hospital	28.1%	41.5%
District Hospital	43.9%	20.8%
Facility 1	33.1%	29.2%
Facility 2	45.3%	22.5%
<i>Averages</i>	37.6%	28.5%
Greater Accra		
Regional Hospital	88.9%	67.9%
District Hospital	80.1%	72.6%
Facility 1	149.5%	76.9%
Facility 2	13.8%	15.8%
<i>Averages</i>	83.1%	58.3%
Northern		
Regional Hospital	3.0%	10.0%
District Hospital	23.6%	21.4%
Facility 1	87.4%	78.8%
Facility 2	16.0%	10.4%
<i>Averages</i>	32.5%	30.1%
Volta		
Regional Hospital	100.4%	56.1%
District Hospital	90.7%	48.0%
Facility 1	82.6%	60.5%
Facility 2	-3.1%	-4.3%
<i>Averages</i>	67.7%	40.0%
Western		
Regional Hospital	64.0%	31.7%
District Hospital	46.5%	39.2%
Facility 1	42.8%	33.7%
Facility 2	58.0%	44.9%
<i>Averages</i>	52.8%	37.4%

CMS Pricing Practices and Financial Performance in 1992

The 1992 MoH Annual Report states that CMS achieved a 91.2% cost recovery rate, receiving 928 million Cedis in revenue against 1.02 billion Cedis worth of issues. This 91.2% stated cost recovery rate must be qualified, as noted above, additional information is needed, including changes in inventory value, purchases and the cost of goods sold. Also, the 91.2% recovery rate on past purchases does not address the issue of future purchases of the stock issued (which in Ghana could increase in cost due to both inflation and devaluation). Even so, the fact that the recovery rate was less than 100% suggests that CMS pricing policies were not adequate to achieve the stated goal of covering replacement cost.

Our review of the 1992 CMS price list and the 1991 & 1992 tender prices suggest that the actual procedure used to develop the CMS price list was adding a 30% (rather than 25%) markup to the invoice price, whether the drugs were obtained locally or imported. None of the tracer drugs which were imported showed a 35% or 40% markup, which should have been the case for imported drugs. These markups were apparently applied to the 1991 tender prices, and prices were not changed when the 1992 tender was received (at least for our sample of tracer drugs). This led to an average markup of 23% for the tracer drug sample, considering 1992 list prices versus 1992 tender prices.

Based on data from the survey of Regional Medical Stores, CMS changed some prices without changing the price list, as documented in the "Regional Medical Store Price Analysis" figures, found in annex V, "Procurement, Pricing and Stock Data." Thirteen of the twenty-one tracer drugs sold by CMS increased in price to regional medical stores, in all but one of these cases, the price increases were different for the same drug to each region showing an increase. Six of the tracer drugs showed price decreases, two drugs decreased in price to more than one region, and in both cases the prices were different. It is hard to discern what policy was actually applied to calculate the price increase and decreases.

In Pricing Model One (above), it can be seen that for CMS to achieve a 25% handling cost (to cover losses due to waste, expiry, and other costs), the weighted average markup for all drugs should have been 41% on all locally purchased drugs, and 70% on internationally priced drugs.

Pricing Model Two (above) shows the markup needed to achieve a 10% handling cost at each level (CMS, RMS and Facility) which was proposed at the 1993 Cash and Carry Workshop, in this model, CMS would need to add a 26% average markup to local drugs, and 55% to international purchases.

Pricing Model Three (above) illustrates the markup required simply to cover inflation and devaluation, with no markup added to cover handling costs such as waste, expiry, etc. CMS needed an average of 16% markup on local purchases and 45% on international purchases to simply meet repurchase costs assuming that there were no losses at all due to waste, leakage or expiry.

The actual weighted average markup on tracer drugs issued from CMS in 1992 was 15%, assuming that half of the drugs issued were purchased at 1991 tender price and half were purchased at 1992 tender price. The weighted average markup for the tracer drugs was lower than the simple average largely because markups were lower than average on high use drugs such as aspirin and paracetamol.

Clearly CMS was not quite achieving full replacement cost for this set of tracer drugs in 1992, much less any additional handling cost. As noted, the 91.2% rate of recovery comparing revenue to purchases strongly suggests that replacement cost was not achieved for the full set of CMS drugs. In countries which are trying to recover only part of the drug replacement cost, a 90% or better recovery rate would be a great achievement, in Ghana, however, this will not allow the system to survive (unless the government provides subsidies for drug purchases)

We were not able to obtain information on the balance of the CMS Revolving Fund Balance at the end of 1992, or on stock values at the beginning and end of the year. Therefore we cannot comment on the status of the CMS revolving fund.

CMS Prices Compared to Wholesale Market Prices

We compared CMS projected 1993 prices for local tender items, assuming a thirty percent markup as for 1992, with the average wholesale prices reported by nine Accra pharmacies. We were able to obtain comparisons for nineteen tracer drugs, as shown in the following table, "CMS Price Compared to Wholesale Market "

On average, CMS 1993 cost price with a 30% markup would be 82% of the average wholesale price at the nine pharmacies, the range was 9% to 242%, and for more than half the items a 30% CMS markup would leave the price at 81% or less of wholesale. This would indicate at least some room for price increases, whether at CMS or lower levels, at least in comparison with the private sector wholesale prices in Accra.

We also compared the price of 15 items against the distribution price of the Christian Health Association of Ghana (CHAG) to health facilities which they serve. On average, a CMS 30% markup would produce prices which would be 92% of the CHAG price, with a range of 62% to 144%. Eight items would be cheaper than CHAG price, and seven more expensive.

Financial Status of Regional Medical Stores and Health Facilities

As noted in the subsection on RPM assessment methods, we do not have data which would allow us to apply standard financial ratios to assess the Cash and Carry revolving funds. We therefore used available data to make inferences.

The table on the following page lists summary financial comparisons for regional medical stores and health facilities. It compares fund balance against 1992 purchases, to determine whether funds are available to purchase drugs in the coming year.

Rational Pharmaceutical Management Project

CMS PRICE COMPARED TO WHOLESALE MARKET

DESCRIPTION	STRENGTH	FORM	Issue Unit	1993	30% Margin	Proj 93 CMS	Accra 93	30%	Accra 93	30%	CHAG	30%
				Unit Cost (Cedis)	on 1993 Cost	30% Markup on 1993 Cost	Wholesale Avg. Price	Markup as % Avg Wlst	Retail Avg. Price	Markup as % Avg. Rtf	May 93 Unit Price	Markup as % CHAG
ACETYLSALICYLIC ACID	325MG	TAB	TABLET	1 56	2 22	2 02	2 51	81%	6 43	31%	2 25	90%
AMODIAQUINE	200MG	TAB	TABLET			25 00	46 14	54%	88 5	28%		
AMOXYCILLIN	25MG/ML	SUS	60ml BOTL	343 00	490 00	445 90	552 5	81%	725	62%	325 00	137%
AMOXYCILLIN	250mg	TAB	TABLET	15 00	21 43	19 50					20 88	93%
CHLORAMPHENICOL	250MG	TAB	TABLET	12 00	17 14	15 60	18 3	85%	26 25	59%	13 75	113%
CHLOROQUINE	150MG	TAB	TABLET			5 65	8 49	67%	13 57	42%		
CHLORPHENIRAMINE	4MG	TAB	TABLET	1 75	2 50	2 28	3 34	68%	6 88	33%	2 73	83%
CO TRIMOXAZOLE	480MG	TAB	TABLET	8 65	12 35	11 24	12 94	87%	17 5	64%	10 08	112%
DEXTROSE IN WATER, I	5%	VIAL	500ml VIA	583 83	834 04	758 98						
DIAZEPAM	5MG	TAB	TABLET	0 84	1 19	1 09	1 89	57%	4 75	23%	1 75	62%
FERROUS SULFATE	60MG IRON	TAB	TABLET	1 48	2 11	1 92	2 08	92%	4 75	40%	1 80	107%
FOLIC ACID + IRON	1MG/60MG	TAB	TABLET			2 05	23 4	9%	32 5	6%		
FRUSEMIDE	40MG	TAB	TABLET			2 47	6 13	40%	12 14	20%	4 05	61%
MEBENDAZOLE	100MG	TAB	TABLET			3 00	29 93	10%	68 66	4%	9 87	30%
METRONIDAZOLE	250MG	TAB	TABLET	4 30	6 14	5 58	6 99	80%	13 75	41%	6 72	83%
MULTIVITAMIN	BP	TAB	TABLET			3 00	1 79	168%	4 69	64%	2 09	144%
ORAL REHYDRATION SA	BP	POW	SACHET			37 00	41 25	90%	59 29	62%	44 00	84%
PARACETAMOL	500MG	TAB	TABLET	2 71	3 87	3 52	2 97	119%	5 28	67%	2 97	119%
PENICILLIN PROCAINE	4MU	VIAL	VIAL			224 00	235	95%	350	64%		
PENICILLIN, BENZYL	5MU	VIAL	VIAL			250 00	103 22	242%	166 67	150%		
PIPERAZINE CITRATE	BP	ELIXIR	LITRE	1150 00	1642 86	1495 00	280					
RESERPINE	0 25MG	TAB	TABLET			1 43	3 9	37%	8 57	17%	2 20	65%
TETANUS TOXOID VACCINE		LIQ	VIAL				440		552 5			

AVERAGES CMS MARKUP AS % OF WHOLESALE

82%

46%

92%

In the case of RMS, accounts receivable as a percentage of total sales is indicated, because high accounts receivable may impact on the fund if they cannot be collected completely and in a timely fashion

The range of weighted average inventory variations is shown because this may be a recording error or delay, or it may represent stock losses. If a variation does represent stock loss, it will affect the fund's viability unless the loss is made up through higher markups. The range indicates the different average variations for tally cards and ledgers, where both record systems are used, a single value indicates that only one of the record systems is in use (or that the average variations were identical)

The value of free issues in health facilities (staff, exempt patients and paupers) is shown as a percentage of the value of total issues, with a breakdown between free issues to staff and to patients. Free issues are losses to the revolving fund, unless covered by markups over and above replacement cost. This was not reported for RMS, and should not be a major factor, since RMS should issue few if any drugs directly to patients or staff

Finally, the table compares the average markup which should have been charged to cover drug replacement cost and free issues with the actual weighted average and markup in 1992, and with the gross markup considering total sales and total purchases (this should also consider change in stock value, but as noted this was not available). The markup required is shown as a range, in which the low value is the minimum for drugs purchased by MoH in Ghana, and the high value is the minimum for drugs which are imported

Data used to construct this table are found in annex V, "Procurement, Pricing and Stock Data" at the end of the report

Financial Status of Regional Medical Stores and Health Facilities Surveyed

As of December 31, 1992

	RDF Balance as % of Purchases	Cash Revenue as % of Sales	Outstanding Accts Rec as % of Sales	Average Inventory Variation	Free Issues % of Total	% Free to Staff	% Free to Patients	Minimum Markup Needed	1992 Weighted Average Markup	1992 Gross Markup Sales on Purch +Donat	Adequate Price?	Fund Revolving?
Regional Medical Stores												
Brong Ahafo	NA	100%	0%	14 23%	NA	NA	NA	12 31%	0%	NA	No	?
Greater Accra	2%	91%	9%	0%	NA	NA	NA	12 31%	4%	16%	No	No
Northern	73%	84%	16%	0 5%	NA	NA	NA	12 31%	28%	100%	Yes	Yes
Volta	163%	100%	0%	0%	NA	NA	NA	12 31%	31%	63%	Yes	Yes
Western	17%	42%	58%	0%	NA	NA	NA	12 31%	33%	111%	Yes	?
Facilities												
Brong Ahafo												
Regional Hospital	17%	87%	NA	4 12%	13%	6%	7%	25-44%	42%	15%	?	No
Goaso Dist Hospital	16%	96%	NA	24%	4%	4%	0%	16 35%	21%	8%	?	No
Sankore H C (Fac 1)	55%	100%	NA	0 2%	0%	0%	0%	12 31%	29%	36%	?	?
Kukuom H C (Fac 2)	96%	90%	NA	16%	10%	5%	5%	22-41%	23%	16%	?	?
Greater Accra												
Regional Hospital	21%	91%	NA	40%	9%	7%	2%	21-40%	68%	14%	?	No
Tema Dist Hospital	17%	84%	NA	66%	16%	16%	0%	28-47%	73%	22%	?	No
Tema Urban Health (Fac 1)	42%	96%	NA	39%	4%	4%	0%	16-35%	77%	54%	Yes	Yes
Tema Newtown H C (Fac 2)	100%	99%	NA	0 11%	1%	1%	0%	13 32%	16%	11%	?	?
Northern												
Regional Hospital	4%	77%	NA	0 1%	23%	23%	0%	35 54%	10%	13%	No	No
Bole Dist Hospital	85%	100%	NA	0 7%	0%	0%	0%	12-31%	21%	145%	Yes	Yes
Tuna H P (Fac 1)	15%	87%	NA	0%	13%	8%	5%	25-44%	79%	18%	?	No
Mole H C (Fac 2)	12%	100%	NA	0 3%	0%	0%	0%	12 31%	10%	0%	No	No
Volta												
Regional Hospital	2%	98%	NA	0%	2%	0%	2%	14-33%	56%	4%	?	No
Keta Dist Hospital	82%	100%	NA	0%	0%	0%	0%	12 31%	48%	96%	Yes	Yes
Anloga H C (Fac 1)	145%	96%	NA	0%	4%	4%	0%	16 35%	61%	6%	?	?
Anyako H C (Fac 2)	71%	100%	NA	0%	0%	0%	0%	12-31%	4%	2%	No	?
Western												
Regional Hospital	4%	84%	NA	24 27%	16%	8%	8%	28-47%	32%	10%	?	No
Tarkwa Dist Hospital	32%	95%	NA	9 11%	5%	2%	2%	17-36%	39%	17%	?	?
Nsuame H C (Fac 1)	228%	86%	NA	36%	14%	5%	9%	26-45%	34%	71%	Yes	Yes
Dompim H P (Fac 2)	73%	99%	NA	5 18%	1%	1%	0%	13 32%	45%	10%	?	?

Using the table to evaluate pricing policy

Given the data available, we have two ways to evaluate pricing policy the weighted average markup on tracer drugs, and the gross markup comparing sales to purchases. The weighted average markup compares the estimated total cost of the total consumption of tracer drugs, using the last cost reported for each drug, against the total revenue for that volume, based on last sales price reported. The gross markup percentage is the difference between total sales and total purchases, as a percentage of total purchases.

Based on this data, we can project whether or not the facility pricing policy was likely to be adequate to cover replacement cost, including free issues and average inventory variation, assuming that the variation may represent stock losses.

The pricing policy is judged to be adequate if the facility's weighted average markup for tracer drugs, and the gross markup on purchases, exceed the markup which would be needed if all drugs were imported, and if the average inventory variation is not a stock loss (or if it is, it is covered by the average markup).

The pricing policy is not adequate if the weighted average markup and the gross markup were lower than the minimum needed for local drugs.

The pricing policy situation is unclear when the observed markups fall between the minimum for local and imported drugs, plus the percentage of average inventory variation. Pricing adequacy would depend upon the mix of local and imported drugs actually purchased and whether or not there was significant wastage or leakage in addition to the reported free issues. It also depends on whether or not the inventory variation represents a stock loss and on the change in stock value from the beginning to the end of the year.

Using the table to evaluate the status of revolving funds

The health of the revolving fund is linked closely with the true overall markup being achieved, we don't know the net markup or margin, due to the lack of information on changes in stock value. We base our evaluation on the apparent adequacy of pricing policy, the fund balance as a percentage of the 1992 purchases (on the assumption that 1993 purchases will be similar), and the accounts receivable for those facilities which had credit sales.

The RMS and facilities purchase drugs 3-4 times per year, therefore, if a revolving fund has enough of a balance to purchase at least 33% of the past year's purchases, it may be solvent (depending upon the value of stock on hand). The balance probably should be at least 50%, to incorporate safety stock. If the facility does have an apparently adequate fund balance, and if the pricing policy is apparently adequate to recover at least replacement costs including any possible losses represented by inventory variations, we assume that the revolving fund is probably solvent, if only one of the conditions is positive, we cannot be sure. If the facility's fund balance is less than 50% of last year's purchases, and the pricing policy is apparently inadequate, we assume that the revolving fund is in danger.

Due to the lack of information on stock value, the assessments of pricing policy and revolving drug status are somewhat speculative. In many of the stores and facilities it is unclear whether or not the pricing policies are adequate and the revolving fund is actually revolving, these cases are noted by "?". In others, however, the status is fairly clear and would not likely change much unless there was a very significant change in stock value during the year. We have offered our best judgement as to the adequacy of pricing and status of the revolving drug fund in those cases.

RMS Results

Based on the information illustrated in the "Financial Status" table, and the evaluation criteria discussed above, we found that three of the five RMS (Northern, Volta and Western) had pricing policies that were apparently adequate to recover replacement cost. Two RMS (Greater Accra and Brong Ahafo) were using pricing procedures that would not recover replacement costs.

The revolving funds at Northern and Volta RMS should have been revolving as of December 31, 1992. The fund at Greater Accra RMS seemed to be in danger. The situation at the Western RMS is unclear, the pricing policy appears adequate, but the revolving fund balance was only 17% of 1992 purchases. We couldn't evaluate Brong Ahafo RMS, due to having no information on purchases.

Health Facility Results

We found that four of the twenty health facilities were fairly certain of achieving necessary markups, these were Tema Urban Health Center (Greater Accra), Bole District Hospital (Northern), Keta District Hospital (Volta), and Nsuame Health Center (Western).

Three facilities were apparently not reaching adequate average markups - the Northern Regional Hospital, Anyako Health Center (Volta) and Mole Health Center (Northern). The data from the other fifteen facilities was not conclusive - their markups may or may not be adequate.

The same four facilities that had adequate markups also seemed to have solvent revolving funds. For seven facilities no conclusion could be reached. There were nine facilities where the revolving fund could be at risk of insolvency, these facilities were

- **Brong Ahafo Regional Hospital and Goaso District Hospital**
- **Greater Accra Regional Hospital and Tema District Hospital**
- **Northern Regional Hospital, Tuna Health Post, and Mole Health Center**
- **Volta Regional Hospital**
- **Western Regional Hospital**

It is unclear why all five regional hospitals have revolving drug funds which seem to be de-capitalizing, but one factor could be free issues - four of the five reported free issues of nine percent or more of total issues. Two of the hospitals also reported more than a 25% average inventory variation.

The impact of exemptions and free issues to staff

The types of formal exemptions in the Cash and Carry Programme are limited. According to policy, these are the only exemptions from cost recovery

- Patients with specific diseases
 - Leprosy
 - Tuberculosis
 - Psychiatric disease
- Immunizations
- Paupers (determined by health facility)

Ministry of Health staff are covered for the cost of drugs, but the current policy is that the staff should pay for drugs, and file a claim for reimbursement from the government. This is the same policy which is to be applied to other civil servants

In practice, staff get free drugs at many, if not most, health facilities, for two reasons

- 1 The policy may not have been clearly communicated to all facilities
- 2 The reimbursement process is cumbersome and lengthy

The data shown in the "Financial Status" table illustrates the fact that exemptions for qualified patients and paupers is not a major concern in most of the facilities surveyed, twelve of the twenty facilities reported no free drugs issued to patients, and only five facilities reported 5% or more as the value of free issues to patients. The highest reported percentage was 9% of total issues provided to patients

Issues to staff is a larger problem, only six facilities reported no free drugs issued to staff, while eight reported 5% or more in free issues to staff. One facility reported that 23% of the total value of issues was used for free drugs to staff

Other "informal exemptions" apparently include retired or transferred former MoH staff. We were told by two knowledgeable sources that exemptions, both formal and informal, are much higher in hospitals than in health centers. This was borne out somewhat by a brief look at Korle-Bu Hospital Inpatient and Outpatient Dispensary

For a three day period, the following breakdown of revenue versus staff in the Outpatient Dispensary was found (all amounts rounded, in Cedis)

	<u>22 June</u>	<u>23 June</u>	<u>24 June</u>
Outpatient Revenue	¢ 88,000	¢ 60,000	¢ 85,000
Staff Issues	¢ 44,000	¢ 88,000	¢ 77,000

In the Inpatient Dispensary, a similar situation was observed, except in this case the breakdown is between sales and issues to wards or credit patients

	<u>22 June</u>	<u>23 June</u>	<u>24 June</u>
Cash sales	¢ 40,000	¢ 54,000	¢ 122,000
Wards/Credit	¢ 55,000	¢ 46,000	¢ 56,000

The Greater Accra Regional C&C Coordinator studied staff consumption of ampicillin in the region in 1990, and was able to demonstrate a decrease in staff drug consumption through introduction of a staff issues monitoring form, supplemented by personal monitoring. This study has not been repeated or extended to other regions.

It would be worthwhile to update studies on the impact of exemptions and "paupers" on the Cash and Carry Programme, reportedly the percentage of paupers is less than 5% in most areas, which seems to correlate with our data. However, it is not clear whether there are few people with incomes at pauper level, or whether the paupers do not regularly use the public health services.

For the coming fiscal year, reportedly about 1.2 billion Cedis had been allocated by the government to fund drug issues to exempt and indigent patients, however, after this figure was reported, it was also reported that a 30% budget cut was required, which presumably reduced this indigent fund. These funds are not intended to cover issues to MoH staff.

Studies on the Impact of the Cash and Carry Programme on Patients

In any cost recovery program, equity must be a major concern. Both from a moral and a societal viewpoint it is important to assure that the poorest and sickest patients are not excluded from health care by cost recovery.

No studies have been done on the impact of Cash and Carry on patients or on utilization of health services since Cash and Carry was implemented nationwide in 1992, the most recent studies on the impact of cost recovery in Ghana were published in 1990 by Waddington and Enyimayew. These authors studied the cost recovery program in the Ashanti and Volta regions, after a 1985 increase in the scope of cost recovery and in the fees, the introduction of higher fees was not confined to drugs, user fees were also introduced or increased for consultations. Some of the operational problems noted are not relevant to Cash and Carry, such as the lack of revenue retention at the local level, but their observations concerning impact on low income patients and on clinic utilization are relevant to the future of Cash and Carry.

In the Ashanti-Akim district of the Ashanti region, utilization fell drastically following the 1985 increases in cost recovery fees (although utilization had been declining in prior years), utilization had not recovered completely by 1988. No conclusions could be reached concerning the specific impact on different socioeconomic groups, although cases were cited of patients who did not receive needed care (or timely care) due to lack of funds. There did not seem to be a disproportionate adverse effect on children under 5 years or on women.

In the Volta Region, fees were also substantially increased in 1985, again utilization dropped significantly, and had not completely recovered by 1988. Urban utilization dropped by over 50%, and had almost reached 1984 levels in 1988. Rural utilization was affected more, falling by 49% in 1985, and showing little recovery by 1988. The proportion of female users, and users in the age group 15-44, increased, while the proportion of children under 5 was essentially the same before and after cost recovery. There were relatively few paupers identified, but an average of 13% of facility drug revenue was used for free treatment for MoH staff and their families.

The need for research on the impact of Cash and Carry, and for information concerning the patient attitudes and ability to pay is practical rather than academic. Given the probable need to increase overall markups on drugs in the Cash and Carry Programme, it is of immediate interest to know how much price elasticity exists, and whether this varies by level of facility or by region (or district)

The report from the Cash and Carry Regional Fact Finding Exercise makes the point that on some items there is much room for price increases, while on others, the private sector wholesale prices are lower than CMS price. Data from our survey of nine Accra pharmacies shows that for the twenty items where we could compare projected 1993 CMS prices with June 1993 average wholesale prices, sixteen items have room for additional markup while still remaining below wholesale price. This information base requires expansion to determine how much prices can be increased, and future studies should consider whether increased markups would disproportionately affect any specific age or socioeconomic groups.

Although prior studies show little selective impact, it is possible that some (or many) of these potential patients are totally lost to the system, and are thus not counted when reports on the percentage of indigent patients are compiled. Obviously the more prices are increased to achieve replacement cost, the more likely it is that the impact will fall heavily on the poorest patients, who are also the patients most likely to have communicable diseases which society wishes to control.

Government has stated the intention to provide budget support for indigent patients, it is likely that this support will be more generous and more certain if hard information is available on the need, therefore the operations research describe should have some priority.

Management Information and Reporting

Effective information flow is essential to effectively manage a program such as Cash and Carry, at present, information does not move effectively up and down the drug supply system. Few reports on CMS stock levels find their way to the Regional Medical Store level and below. In our survey sample, only one RMS reported receiving a CMS stock report last year (and only one edition in that case).

The Cash and Carry Operations Manual introduced 16 forms and report formats to be used by all facilities. The Operations Manual has not yet been put into effect nationwide, though some of the report formats are being used. It lays out a complete series of accounting forms and procedures, which seem more than adequate to manage Cash and Carry affairs, we do not know how widely all of these forms are used.

We found that none of the facility or regional stock and financial reports are copied to the central MoH, they are apparently filed at regional headquarters (and in many cases not provided to regional Cash and Carry Coordinators). This has left the entire pharmaceutical system operating in a bit of an information vacuum, which is worsened by the difficulty in telephone communications and transport.

Our survey found that other than the computer used by the Greater Accra Regional Cash and Carry Coordinator, no computers are available in the technical part of the Cash and Carry Programme. The Greater Accra Regional Coordinator has amply demonstrated the value of a computer in reviewing drug use practices, such as staff consumption of free drugs, and in using reports from the computer to change inappropriate practices.

Monitoring/Supervision

According to the Acting Director of Pharmaceutical Services, at least some pharmacists have written job descriptions, though we were unable to obtain copies. It is unclear whether any other staff in the drug supply system are covered by job description.

The Cash and Carry Programme is producing an annual schedule of activities which qualifies as a workplan. No other formal individual or departmental workplans or performance evaluations are done for staff in the supply system, although the Ministry does produce an annual policy statement. Apparently, the Cash and Carry Operations Manual is the only written procedure manual in the drug supply system, it was reviewed for formal adoption at the June 1993 Cash and Carry Workshop. Principal issues addressed by the Cash and Carry manual are

- Monitoring teams and committees
- Bank accounts
- Spending authority
- Reporting dates for returns
- Dispensing policies
- Dispensary monitoring
- Accounting procedures and books
- Reports required
- Donation management
- Issue of drugs to cash patients, credit sales, and staff
- Monthly stock taking
- Dispensary security

At the Central Level, the two offices primarily responsible for outreach monitoring in the drug supply system are the Acting Director of Pharmaceutical Services (for technical pharmacy issues), and the Director of Supply and Procurement (for CMS and distribution). Based on information received during our visit, it is unclear how frequently such on-site monitoring actually occurs. There is no formal schedule in either case, and there are resultant problems, particularly at CMS (as discussed later in the report).

Both regions and districts have health management teams, which are responsible for monitoring activities at the district and health facility level, respectively. We have not yet fully analyzed the findings of the Regional Survey on this issue, but apparently their activities at the health facility level are constrained.

The Cash and Carry Operations Manual calls for Institutional Monitoring Committees and a Regional Monitoring and Supervision Team, to meet at least monthly, it is unclear to what extent this has been implemented, but it was a topic of discussion at the June 29-July 1, 1993 Regional Cash and Carry Workshop, and is expected to be integrated into the C&C workplan for 1993-1994.

The Cash and Carry Programme carried out one major monitoring exercise in 1992, the Regional Fact Finding Exercise. This was a nation-wide survey which visited 93% of the public sector facilities in the country, to obtain information on the range of drugs actually available, the status of the essential drugs list, problems with expiry, problems with the drug distribution system, pricing practices (public and private), financial management and cash available. We have compared our findings with that of the Regional Fact Finding Exercise, when there is corresponding data.

We examined one 1992 Cash and Carry monitoring report (from Northern Region), it is unclear whether this report was done as part of the Regional Fact Finding Exercise. The report consists of a few lines of observations on staffing, clinic organization, and utilization for each site visited, followed by a general discussion of District Health Management Team function, medical care provided, cold chain, status of structures and storage areas, accounts, transport and workload. There is little quantitative data, and no summary of data for all facilities.

The role of the Cash and Carry Coordinator still seems a bit undefined, which reportedly has hampered their ability to exert leverage on the system (and to gain access to funds for monitoring visits). Based on our experience with the Coordinators from five regions, this is a very capable group of people who should be able to take on expanded roles in assuring proper functioning of Cash and Carry. They will need access to travel funds and recognition for the services they provide in order to maximize their effectiveness.

The process of monitoring and supervision is made much more difficult by chronic problems in obtaining funding for transport, whether fuel costs or out of station allowances. This is not a new problem, and it clearly has not been solved. Related constraints are the distances involved and the lack of reliable telephone communication in most parts of the country.

Procurement at the Central Ministry of Health and Other Levels

MoH Access to Funds for Procurement

One of the primary reasons for embarking on the Cash and Carry Programme in 1992 was the chronic shortage of funds for procurement of drugs. Each year the MoH submits its budget for approval to the Ministry of Finance, where each year the request is reduced to produce the MoH allocation. For example, the recurrent allocations in 1992 were approximately one tenth of the budget request.

Once an allocation is approved, the budgeted funds are released in quarterly allocations, subject to periodic announcements by the Controller General's Office that new financial ceilings will limit the amount that can actually be spent. While we were in Ghana, a 30% budget cut was announced, which meant that all line items must be cut in the current budget.

Since Cash and Carry, there is less concern with access to funds for local purchases, since the revolving funds are used, although as noted in the previous section, at least some of the Cash and Carry funds are probably de-capitalizing. There remain major problems in gaining foreign exchange guarantees from the Bank of Ghana for foreign purchases.

The 1990 foreign tender items were not received until 1992, due to the inability to get the needed foreign exchange to pay the vendors, who do not offer credit. The tender was done in 1990, money was budgeted in 1991, and finally released in 1992.

Foreign exchange is not a large problem when a donor or mechanism such as a World Bank loan can guarantee foreign exchange coverage. The 1991 tender was backed by CIDA, while the 1993 tender is backed by World Bank loan funds. The problem is that the loan line item for drug purchases will probably be exhausted next year. Reportedly there are large sums of donor allocated funds available to the Ministry, but these are not for drug purchases. This means another financing mechanism must be found for purchasing imported drugs.

Meanwhile due to the rapid devaluation of the Cedi against hard currencies in recent years, it costs much more in Cedis to purchase the same amount of drugs, the recent changes were

	<u>Cedi to 1 US\$</u>
Mid-1991	370-1
April, 1992	408-1
August, 1992	447-1
November, 1992	505-1
Early 1993	600-1
June, 1993	600-1 (official) 638-1 (private forex)

Thus, there has been close to 50% devaluation in the past year, and due to the declining market for cocoa, which is one of Ghana's main exports, pressure on the Cedi is likely to continue.

The August 5, 1993 edition of the "World Bank News" reported the following quarterly and monthly trends for cocoa prices, all figures represent US\$ per kilogram

QUARTERLY AVERAGES			MONTHLY AVERAGES		
Oct-Dec 1992	Jan-Mar 1993	Apr-Jun 1993	April 1993	May 1993	June 1993
\$1 061	\$1 003	\$0 998	\$1 012	\$0 996	\$0 987

The value of international drug purchases as a percentage of total drug purchases went from 20% in 1991 to 46% in 1992, with no reported drastic increase in the number of items purchased externally, however, we did not see the 1991 contracts, so the mix and quantities may explain most of the difference.

Progressive devaluation also has an effect on local purchases, since those private sector suppliers who import drugs must pay more for foreign exchange, and some have difficulty obtaining raw materials.

Drug procurement procedures

The Government and Ministry of Health policy is that all drugs and supplies must be purchased by competitive tender, through the Ghana Supply Commission, except in emergencies. Procurement at all levels is limited by policy to drugs included in the 1988 National Essential Drugs List and National Formulary.

In the past, drug procurement was managed by the Pharmacy Division, with approval from the Chief Director, who had sole spending authority in the Ministry of Health. Since re-organization of the MoH, procurement is managed by the Director of Supply and Procurement, and all drug purchases must be approved by the Procurement Committee. This change has already proven its worth by avoiding at least one large purchase of unneeded drugs, which might have gone through if the Committee was not reviewing all purchases. The procurement committee is composed of the following positions:

- Deputy Minister of Health
- Director of Medical Services
- Deputy Director of Medical Services
- Director of Health Services Administration
- Chief Director of the Ministers Office
- Director of Supply and Procurement
- Director of Pharmacy Division
- Director of Planning
- Financial Controller

At the RMS and Health Facility levels, there are active procurement committees in three of five RMS and seven of twenty health facilities surveyed. However, it is not clear that these committees have the same degree of authority over procurement as at the central MoH.

Quantification of drug requirements

The central MoH does one annual tender to cover a full year's estimated requirements throughout the system. The adverse impact of inappropriate quantification methods or bad data can be substantial, with stockouts of fast moving items, over-stocks of slow movers, and emergency purchases to fill the gaps.

Accurate quantification of drug needs has been a difficult problem in the MoH, due in part to lack of reliable information on consumption at various levels of the system, and in part to lack of expertise and training in proper quantification procedures. Quantification has to date been the sole responsibility of the central MoH, until 1992 the Director of Pharmacy was responsible, but this responsibility has now shifted to the Director of Supply and Procurement.

In 1989-1990, the MoH Drug Estimation Committee did a national quantification on a morbidity basis, with extrapolations through 1992. Apparently that committee has since become moribund. In 1991, reportedly the 1990 work was used without updating, and in 1992 this may also have been the case, though according to both the Director of Supply and Procurement and the Acting Pharmacy Director, a combination of morbidity and consumption was used. As noted, however, there has been very little reliable information available on consumption. According to our information, no standardized reorder quantity formulas were applied in the 1991 or 1992 quantifications.

The 1993 MoH quantification was a step forward, in that CMS stock balances and average monthly consumption were used to project stock status as of June 1993, and to calculate quantity to order. There is a column on the printout for "pipeline status" but no information shown, it is possible that no items were still on order. There was definitely little data on consumption at the regional and district level. Reportedly CMS consumption figures for 1992 were adjusted upwards by 25% to account for "expansion of services" in projecting 1993-94 requirements.

There were some apparent anomalies in the 1993 quantification, as shown in the "Analysis of 1993 Tender" in the following section on CMS 1993 Procurement. Aspirin tablets (acetylsalicylic acid) were ordered in a 3 month quantity based on average monthly consumption, when only 3 months' worth of stock were on hand at CMS. Chlorpheniramine tablets were ordered in a 7 month quantity with 2 months' worth of stock on hand. These items will likely need to be re-ordered unless there was a quantity already on order which was not shown on the quantification document. Six items were ordered in quantities equal to twenty months average consumption. One was three years' worth of consumption (co-trimoxazole tablets) and one was apparently 12 years' worth (piperazine citrate elixir), this may be a problem with pack size comparisons, and if so, the excess may not be real.

As part of restructuring, it has been decided that regions and districts will be responsible for putting together their own quantifications, which will be assembled into one master list (presumably for the 1994 tenders). In the Cash and Carry workplan, it is noted that Regional Cash and Carry Coordinators will facilitate this process.

The responses in the Regional Survey to questions about methods used to compute order quantities indicate that none of the RMS or health facilities visited are using standardized formulas to estimate needs, which argues for development of a standard quantification procedure, with guidance and training at all levels of the system.

Tendering and Adjudication Process

The Ghana Supply Commission (GSC) is the government agency responsible for procuring supplies for all government departments including the Ministry of Health. The GSC charges a 4% fee on all procurement, which is reasonable by international standards. The International Trade Centre report suggested that the Ministry could save money by doing tenders themselves, but it is questionable whether this could be done for 4% of tender value, if all costs are considered, and it is very doubtful that tenders could be managed as efficiently, given existing constraints. The Ghana Supply Commission executive director told us that the fee is negotiable based on needs of clients, it is unclear whether the MoH has successfully negotiated reduced fees in the past.

The tendering process followed is

- 1 Ministry of Health compiles a procurement list, and submits it to GSC
- 2 GSC conducts the tender, soliciting offers from known local suppliers and foreign suppliers who have submitted a vendor registration form. In the case of purchases financed by World Bank loan, W B -approved international competitive bidding procedures are used. This process takes from one to two months. Tender offers are collated by a dBase program prepared in-house.
- 3 A GSC committee reviews offers, and prepares recommendations for award, normally to the lowest bidder. This is submitted as a computer printout to the MoH.

- 4 The MoH Procurement Committee reviews the recommendations, and normally accepts them, unless the low bidder has a poor reputation for performance, or there are product quality concerns. In the latter case, samples are requested and tested (it is unclear how often this happens). The MoH Procurement Committee discusses concerns with GSC, and consensus is reached on the preferred suppliers.
- 5 GSC issues purchase contracts to selected suppliers, specifying delivery date(s). Generally the contracts specify one delivery, or two in the case of large quantity orders.

Split tender awards (awards to two or more suppliers for the same item) are made occasionally, we did not see evidence of this in the contracts reviewed, but the Acting Director of Pharmacy reported that this has been done either to support local suppliers or in cases where the capability of the low bidder to supply full tender amounts is in doubt. Split tenders as a regular practice are questionable in most settings, because this reduces pressure on suppliers to offer the lowest possible tender price.

Secondary supplier awards are not made, therefore, if the contract supplier is unable to perform according to the contract, a new tender is required. In cases where the original estimated quantity has proved too low, the MoH and GSC approach the supplier who had the tender contract, and ask if additional quantities can be obtained at the same price. Based on our review of 1991 and 1992 contracts, this was granted in most cases. If the request is not granted, a formal tender or informal solicitation of quotes is used.

The procedure for making "emergency" purchases in the past has reportedly been somewhat flexible, now all such purchases must be approved by the Procurement Committee.

When funds available are inadequate to purchase the full quantities called for in the quantification, according to the Acting Pharmacy Director, high use items are given preference.

In most successful procurement operations, specific procedures are used to determine which drugs are most urgently needed, this is critical when available funds do not permit the purchase of the full number and quantity of drugs requested. Procedures which are widely used for this purpose include the ABC analysis, which classifies by expense and utilization, and the VEN analysis, which classifies drugs by relative therapeutic need. In Ghana, these procedures have been used. When finances have been tight, reportedly the Ghana MoH has simply purchased the most frequently used drugs first (in full quantity), rather than reducing quantities and purchasing a broader range of drugs.

There is no formal pre-qualification of bidders, though GSC does use a vendor registration form for overseas firms, which among other basic information, asks whether the firm will tender in Cedis. No specific information on financial standing is solicited, but it does ask for the name of the vendor's bank and three references.

Drugs are tendered by INN, the tender document and contract do not specify which pharmacopeial standard is acceptable, they do request that the vendor specify the standard which was used in manufacture on international orders. The 1992 international contracts called for certificates of analysis and WHO Certification of Good Manufacturing Practice in some, but not all cases. Most, but again not all, specify delivery dates. The contracts do not specify packaging. In 1992, an effort was made to require "MoH" embossment on tablets and capsules from local vendors. It is unclear how many complied, and the requirement has since been dropped, leaving those local vendors who did comply holding useless equipment. None of the contracts have language penalizing the vendor for failure to perform.

Procurement MIS and Reporting

The Ministry of Health has only a rudimentary procurement information system, orders are placed in a file, where they can be located if there are questions, there is no mechanism in place to report information concerning procurements which are completed or in process.

The Ghana Supply Commission has a database file containing all orders processed by them, they currently do not provide reports to the MoH, but said that they could do so if requested. This would seem to be very useful information for the procurement committee. The Cash and Carry Programme calls for monthly reports from each facility on stock levels, consumption, and status of the revolving fund, these reports are apparently forwarded to the regional administration, but the information is not passed on the central level, which does the annual tender. There has been little reliable information available on consumption either at CMS or at the regional and district levels.

1993 CMS Procurement

The table on the following page shows quantities projected on the 1993 quantification compared to quantity on hand and average monthly consumption in 1992. This data is used to project the number of months' worth of stock ordered for each item (assuming that the full quantities from the quantification were ordered).

The table also shows the expected pack cost for local tender items (since they have been adjudicated) and the total cost for those items (as well as the simple and weighted average inflation between 1992 and 1993).

We had questions about the appropriateness of quantities ordered for some items, they were raised above under Quantification. It is worth mentioning that both ferrous sulfate and folic acid tablets were ordered separately in large quantities (18 million ferrous sulfate tablets) when CMS had nearly 21 million tablets of the ferrous sulfate/folic acid combination tablet.

The total projected cost for the quantities of tracer drugs projected in the 1993 quantification would be US\$650 million, which is about half of the 1.38 billion Cedis estimated as the value of the 1993 local tender. The weighted average inflation between 1992 and 1993 is only 7%, this is a decrease from the 13% rate between 1991 and 1992.

The following three year totals for central Ministry of Health drug purchases were provided by the Director of Pharmacy Services (all amounts in Cedis)

<u>Year</u>	<u>Local (%)</u>	<u>Foreign</u>	<u>Total</u>
1991	1,317,044,700 (79%)	344,659,665	1,661,704,365
1992	1,407,392,549 (46%)	1,648,731,864	3,056,124,413
1993	1,383,495,322 (48%)	1,530,697,000	2,914,192,322

The 1993 local tender had been adjudicated at the time of our survey, the 1993 foreign amounts are estimated by the Acting Director of the Pharmacy Division, based on information from the Ghana Supply Commission. The amounts in the table do not include shipping charges if any, GSC commission, or other fees such as port charges.

ANALYSIS OF 1993 MINISTRY OF HEALTH LOCAL TENDER QUANTIFICATION

DESCRIPTION	STRENGTH	Issue Unit	1993 Local Tender				Avg Mon Cons. Based on Tally Card	Order Qty At Avg Mon Cons.	Pack Cos (Cedis)	1993 Unit Cost (Cedis)	Projected Total Cost (Cedis)	% of Local Price Inflation 1992-93	C&F Unit Cost, Cedi
			Pack	Actual Qty In Stock at CMS (6-9)	CMS Stock Level in Months (6-9)	MoH Order Quantity (Units)							
ACETYLSALICYLIC ACID	325MG	TABLET	1000	6,425,000	3	2,796,800	2,058,000	3	1,555	1 56	4,349,024	8 0%	1 44
AMODIAQUINE	200MG	TABLET		1,531 000	18		833,658						4 69
AMOXYCILLIN	25MG/ML	60ml BOTL	1	6,982	1	218,239	9,779	22	343	343 00	74,855,977		
AMOXYCILLIN	250mg	TABLET	1000	471,000	2	7 636 650	282 667	27	15,000	15 00	*****		
CHLORAMPHENICOL	250MG	TABLET	1000	428,000	1	3,863,000	290,417	13	12,000	12 00	46,356,000	-20 0%	15 00
CHLOROQUINE	150MG	TABLET		16 818,000	17		103,417						5 00
CHLORPHENIRAMINE	4MG	TABLET	1000	953,000	2	2,974,675	435,792	7	1,750	1 75	5,205,681	18 6%	1 48
CO TRIMOXAZOLE	480MG	TABLET	1000	316 000	1	9,464,350	261 833	36	8,648	8 65	81 847 699	-3 9%	9 00
DEXTROSE IN WATER	5%	500ml VIA	1	?	N/A	152,271	6 786	22	584	583 83	88 900 378	29 7%	450 00
DIAZEPAM	5MG	TABLET	1000	1,323,000	5	6,417,050	282,998	23	835	0 84	5,358,237	11 3%	0 75
FERROUS SULFATE	60MG IRON	TABLET	1000	15 000	0	17 937 067	712 917	25	1,475	1 48	26 457 174		
FOLIC ACID + IRON	1MG/60MG	TABLET		20,800,000	85		245,333						
FRUSEMIDE	40MG	TABLET		5 334 000	45		117 917						
MEBENDAZOLE	100MG	TABLET		9,000	0		253,000						2 30
METRONIDAZOLE	250MG	TABLET	1000	2 000	0	14 397,400	511 750		4,296	4 30	61,851 230	13 1%	3 80
MULTIVITAMIN	BP	TABLET		11,000	0		1,009,000						
ORAL REHYDRATION SA	BP	SACHET		234,300	12		19 617						
PARACETAMOL	500MG	TABLET	1000	3,522,000	2	45,577,300	2,311,950	20	2,708	2 71	*****	12 8%	2 40
PENICILLIN PROCAINE	4MU	VIAL		406,000	12		32 712						246 84
PENICILLIN, BENZYL	5MU	VIAL		144,000	471		306						142 80
PIPERAZINE CITRATE	BP		1	3,223	32	14 700	99	148	1 150	1150 00	16 905 000		
RESERPINE	0 25MG	TABLET		4,094,000	27		149,417						1 15
TETANUS TOXOID VACCINE		VIAL		185 080	35		5 215						240 72

Notes on 1993 procurement

- Note that both FeSO₄ and Folic Acid were ordered in spite of larges stocks of the combination tablet
- The package size of Piperazine actually ordered is unclear, since the quantification did not specify a pack size but did project a unit price of 40 Cedis, which would not correspond with a 1 litre pack

Average

32

Total

8 7% Avg Infl

7 3% Weighted

Avg Infl

Data from the RPM Survey on 1992 Procurement at CMS, RMS, and Health Facilities

The "Procurement Summary - 1992 Purchases" table, on the following page, shows data on the 1992 drug purchases by CMS, and by the five regional medical stores and twenty health facilities which were surveyed

For CMS, the table shows the total drug purchases, the percentage purchased through local tender and international tender, and the percentage which were apparently non-tender purchases

For RMS and health facilities, the table provides total purchases, the percentage of drugs purchased through the CMS or RMS, and the average comparison between CMS or RMS price and the private sector price (for drugs which were purchased from both sources) The presence or absence of an institutional procurement committee is indicated

The percentages of drugs purchased by tender (and non-tender), and from CMS/RMS and the private sector, are percentages by value The data which were used to construct this table is found in annex V, "Procurement, Pricing and Stock Data," at the end of the report

Ghana Regional Survey

Procurement Summary - 1992 Purchases

	TOTAL PURCHASES (CEDIS)	% LOCAL TENDER	% INTL TENDER	% NON- TENDER	TENDER PRICE AS % OF MSH AVERAGE INTL PRICE
Central Medical Stores	3 056 124 413	32.9%	53.9%	13.2%	78.90%
	TOTAL PURCHASES (CEDIS)	% FROM CMS or RMS	% FROM PRIVATE SECTOR	ACTIVE PROCUREMENT COMMITTEE?	PRIVATE SECTOR PRICE AS % OF CMS or RMS PRICE
Regional Medical Stores					
Brong Ahafo	N/A	0.0%	0.0%	YES	N/A
Greater Accra	247 016 590	38.9%	61.1%	NO	172.61%
Northern	28 721 000	91.8%	8.2%	NO	60.00%
Volta	83 275 435	59.3%	40.7%	YES	35.00%
Western	114 811 319	70.0%	30.0%	YES	109.23%
<i>Averages</i>	94 764 869	52.0%	28.0%		94.21%
Facilities					
Brong Ahafo					
Regional Hospital	31 794 688	67.8%	32.2%	YES	136.79%
Goaso Dist. Hospital	7 561 435	80.7%	19.3%	NO	148.47%
Sankore H C (Fac 1)	4 108 224	31.8%	68.2%	NO	145.44%
Kukuom H C (Fac 2)	1 047 490	100.0%	0.0%	NO	N/A
Greater Accra					
Regional Hospital	17 707 245	75.7%	24.3%	YES	125.09%
Tema Dist. Hosp	49 970 865	39.6%	60.4%	NO	124.33%
Tema Urban H C (Fac 1)	25 188 934	42.2%	57.8%	YES	100.75%
Tema Newtown H C (Fac 2)	3 277 727	97.8%	2.2%	YES	N/A
Northern					
Regional Hospital	26 900 270	93.1%	6.9%	YES	N/A
Bole Dist Hosp	1 273 900	100.0%	0.0%	YES	N/A
Tuna H P (Fac 1)	2 154 419	10.9%	45.5%	NO	N/A
Mole H C (Fac 2)	447 950	100.0%	0.0%	NO	N/A
Volta					
Regional Hospital	5 308 267	74.9%	25.1%	NO	N/A
Keta Dist Hosp	29 138 583	74.2%	25.8%	NO	N/A
Anloga H C (Fac 1)	2 183 286	100.0%	0.0%	NO	N/A
Anyako H C (Fac 2)	746 691	100.0%	0.0%	NO	N/A
Western					
Regional Hospital	48 515 600	17.4%	82.6%	YES	N/A
Tarkwa Dist Hosp	11 505 000	78.2%	21.8%	NO	N/A
Nsuem H C (Fac 1)	800 000	35.0%	65.0%	NO	N/A
Dompim H P (Fac 2)	800 000	100.0%	0.0%	NO	N/A
<i>Averages</i>	13 521 529	71.0%	26.9%		130.1%
<i>Averages Regional Hospitals</i>	26 045 214	65.8%	34.2%		130.94%
<i>Averages Distinct Hospitals</i>	19 889 956	74.6%	25.4%		136.40%
<i>Averages, Health Facilities</i>	4,769,044	75.8%	24.2%		123.10%

CMS Purchases

In 1992, as shown in the "Procurement Summary" table, the Ministry purchased 32.9% by value of the drugs through local tender and 53.9% through international tender. The other 13.2% of drugs purchased were not documented on local or international tenders, and were presumably "emergency" purchases. The MoH does not have enough information to know what percentage of actual need is covered by the annual tenders.

About 402 million Cedis more was spent locally than was documented on the contracts. For 1991, the difference was 51.5 million Cedis. This is not to say that all of these purchases were outside the standard tender system, it is possible that we didn't receive all of the GSC contracts for one or both years.

RMS Purchases

According to the 1992 Ministry of Health document which introduced the Cash and Carry Programme, "all government health facilities will buy their drugs from the medical stores." This policy has not been followed, at least in part because the CMS based procurement and distribution system has not been able to supply the drugs in the quantities required at the time they are needed.

Brong Ahafo RMS did not report their 1992 drug purchases. The other four RMS purchased significant amounts of drugs from the private sector (ranging from 8% to 61% of total 1992 purchases). The RMS with 61% private purchases was Greater Accra, which is the closest RMS to Tema, where CMS is located.

The prices paid in the private sector apparently varied widely. The Northern and Volta regions paid less on average from the private sector than from the public sector, Western paid slightly more, and Greater Accra paid considerably more from the private sector for the same drug when purchased in the private sector. In some ways this is surprising, since most of the private sector distributors are located in Accra, and it would seem to be easier to negotiate competitive pricing.

Brong Ahafo, Volta, and Western RMS have active procurement committees which guide the purchasing process, Greater Accra and Northern RMS do not have active committees.

Health Facility Purchases

Only four of the twenty health facilities reported no private sector purchases, 13 reported more than 20% of total purchases from the private sector, and five reported more than half of the purchases came from private suppliers. Two of the five facilities with more than 50% private purchases are located in Tema, and presumably are quite close to CMS.

We only were able to analyze comparative pricing in six health facilities, the average private sector price for the same drug was 130% of the CMS price, with a range of 101% to 148%.

Seven of the twenty health facilities surveyed reported having active procurement committees.

Non-formulary Procurement

We found no evidence that CMS purchased drugs in 1992 which are not listed in the Ghana National Essential Drugs List and National Formulary. As noted, we did not see documents covering the total value of 1992 purchases, so it is possible that some non-formulary drugs were purchased.

Ampicillin suspension was deleted from the National Essential Drugs List and National Formulary in favor of Amoxicillin suspension in 1988, but reportedly some facilities have continued to stock ampicillin. We surveyed this practice in the RMS and health facilities, and found that three facilities had ampicillin in stock.

<u>Facility</u>	<u>Quantity in Stock</u>
Ridge Hospital	200 bottles
Tema General Hospital	2,200 bottles
Effia-Nkwanta Hospital	200 bottles

None of the three facilities reported difficulty in obtaining amoxicillin suspension, although 5 of the other 17 health facilities did report problems with amoxicillin shortage.

The table on the following page shows "Non-formulary Drugs Stocked by Health Facilities," six health facilities reported regularly stocking non-formulary drugs. In five of the six facilities the explanation was related to demand by medical officers in the facilities (in the other, no explanation was given). One of the facilities noted that the demand occurs after drug company representatives leave samples with medical officers.

Ghana Regional Survey

NON-FORMULARY DRUGS STOCKED BY HEALTH FACILITIES

Non-Formulary Drugs Stocked	Number of Drugs	Reason Cited
BRONG AHAFO REGION		
Regional Hospital	"Some"	Demand from medical officers
Goaso Dist Hosp	2	Request from medical officers
Sankore H C	2	No explanation
GREATER ACCRA		
Tema District Hospital	2	Prescribed very often
Tema Urban H C	20	Doctors prescribe them
WESTERN		
Regional Hospital	Not stated	Found to be more efficacious after drug rep left samples

Logistics and Distribution Through the CMS System

CMS LOCATION AND STORAGE SPACE

The Central Medical Store of the Ministry of Health is located at Tema, 22 Km from Accra on the coastal road. The CMS is supervised by the Procurement and Supply directorate of the Ministry of Health. Tema is the main industrial area of the country and also the main harbor/port of entry to Ghana. This is the rationale for the CMS location, but it is a factor in the lack of staff presence and on-site supervision, since most staff live in Accra, and reportedly rarely spend a full day at the CMS, due both to other responsibilities, as well as to the difficulty in commuting.

The CMS is located on a large compound (15,000 sq meters) which includes an administrative section, a garage and eight bays/storage areas. Medical supplies and drugs are stored in bay three to eight. Each of these bays has a surface area of 816 sq meters (60.5m x 13.5m).

None of these bays have temperature and/or humidity control devices. The presence of a small extractor fan contributes very little to ensure adequate storage conditions. During our visit the heavy falling rain confirmed that the roof is leaking in each of the bays and that the drainage of rain water is inadequate. Reportedly, repairs to the roof will be effected soon with funds from the current World Bank loan. The concrete floor of the stores have not been coated, which leads to excessive dust in the facility, it is unclear whether the floors will be coated during the upcoming rehabilitation of CMS.

Bay three, known as the UNICEF storeroom, is used to stock family planning devices and drugs, spare parts for vehicle and small instruments. UNICEF recently renovated this storeroom at a cost of US\$40,000 for construction and US\$44,000 for metal shelving. This installation allows supplies to be arranged according to project codes and supply list numbers. Bays four and five are used to store mainly medical supplies on pallets.

Bays six, seven and eight are the drug areas, reserved to store respectively ENT preparations and galenicals, liquid forms, and tablets and injections. Storage is also "organized" on pallets but there is no specific classification used and the same item can be stored in two different locations. A few shelves are in each of these bays but are not used. The lack of coordinated storage made it difficult to conduct a physical stock count. It is unclear how often CMS actually does physical stock counts. Bays six and seven each have a built-in cold room, which are too small to meet cold storage requirements when stock levels are high.

The stores area is occasionally fumigated to control pests, and we did not see any obvious signs of pest infestation in the drug storage areas. Fire protection is provided by 16 fire extinguishers and one fire hydrant. Electrical power supply is provided through the national electric system, which is reliable, there is no auxiliary generator. Handling equipment available at the CMS includes hand trucks, sack trudges, hydraulic forklifts-1000 kg (4), roller crowbars and 25 ton forklifts (2).

Administrative and managerial tasks are done in the main office building and in the logistic section office which is attached to the UNICEF store. The main offices section is equipped with desks, filing cabinets, typewriters and ceiling fans. The logistics section office is equipped with desks, filing cabinets, an air conditioner, a photocopier, and now micro computers (which are discussed below).

CMS Security

Access to the compound and premises is controlled during the day by 4 security guards employed by the CMS and 10 Civil Defense Organization members (CDO), and at night by 10 armed CDO guards. A security light illuminates the compound boundaries.

Despite the security services, theft of CMS drugs and supplies has been reported, according to the CMS staff interviewed, most of the problems occur at night, though we have no evidence that this is true. We do not have information on the extent or value of reported theft, but presumably this was one focus of a recent government audit of CMS records.

Staffing and Supervision at CMS

The MoH Director of Supply and Procurement is responsible for managing CMS. Reportedly the initial plan was that this office would be based at the CMS, but this is not the reality, and it is unclear how often the Director of Supply and Procurement is able to visit CMS. A storekeeper is in charge of day-to-day administration of CMS, this storekeeper has no formal training in supply management.

The office of the Director of Pharmaceutical Services is responsible for the technical supervision of the pharmacists at CMS, but it is not clear how often supervisory visits to CMS occur. There is no formal or informal schedule for visits by either the Director of Supply and Procurement or the Director of the Pharmacy Division.

The staff assigned to CMS includes

- 2 Pharmacists
- 20 Storekeepers
- 1 Telephone operator
- 6 Typists
- 3 Clerks
- 10 Laborers
- 10 Drivers

Supervisory relationships are not simple in that the storekeepers are not employed directly by the Ministry of Health (apparently they are attached to the Ministry of Finance). The storekeepers are supervised technically and administratively by the Director of Supply and Procurement. The pharmacists, who are Ministry of Health employees, are responsible for CMS drugs, they report technically to the Director of Pharmacy and administratively to the Director of Supply and Procurement. Reportedly the pharmacists and storekeepers do not have very amicable working relationships.

There are no visits from the CMS to the consuming facilities, nor are there regular meetings organized with the personnel from the region to discuss drugs and medical supplies matters. The exception has been the two Cash and Carry Workshops, which have focussed heavily on the supply system.

CMS Workload

The CMS serves 16 health institutions of the Ministry of Health

- 10 Regional Medical Stores
- 2 Teaching Hospitals (Korle-Bu and Okomfo Anokye) in Accra
- 3 Psychiatric Hospital (two in Accra and one in Cape Coast)
- 1 Leprosarium

Vertical programs like EPI, Family Planning, Maternal and Child Health, Onchocerciasis, Schistosomiasis and AIDS are not integrated into the CMS system at this time, for two related reasons

- 1 The CMS-based logistics system has not performed adequately to assure delivery of needed supplies to these programs at each level of the system
- 2 Donors who sponsor the vertical programs provide support for separate distribution systems

The MoH (and at least some of the sponsoring donors) hope to eventually integrate all vertical programs if the CMS system can be made more effective

Only 95 store issue vouchers (SIV) were processed in 1992 for drugs, with the following distribution

<u>Region</u>	<u># of SIV</u>	<u>Hospital</u>	<u># of SIV</u>
G/ACCRA	8	Korle-Bu	17
UPPER EAST	6	Okomfo/A	9
CENTRAL	13		
VOLTA	3	Others	47
ASHANTI	11		
EASTERN	8		
B/AHAFO	6		
NORTHERN	3		
WESTERN	6		
UPPER WEST	5		

This is a limited workload for a warehouse with the capacity and staffing of the MoH CMS, and it may be a factor in producing, and a function of, irregular work attendance by some CMS staff. When the workload is irregular, and undemanding most of the time, staff may feel that full-time attendance is not essential. Of course, when critical staff are not present, the institutions served cannot reach them, which may serve to decrease the reliance on CMS, and the workload. Also, when CMS is chronically unable to supply a large number of critical items, as was reported in the Regional Fact Finding Exercise, and the recent Regional Survey, this too tends to decrease reliance on CMS (and therefore the workload).

Data in the table below illustrate the change in demand from CMS for five of the tracer drugs. The 1992 Regional Fact Finding Exercise provided the 1991 and 1992 data, while the data for the past twelve months (June '92 through May '93) came from this assessment.

The RPM data came from the CMS tally cards, it is unclear which records were used to compile the Regional Fact Finding data.

Change in CMS Average Monthly Consumption

<u>Drug</u>	<u>1991</u>	<u>1992</u>	<u>6/92-5/93</u>
Chloroquine Tabs	3,166,916	713,100(78%)	1,013,417
Amodiaquine Tabs	250,000	20,000(92%)	288,887
Diazepam Tabs	719,000	130,700(82%)	338,490
Metronidazole Tabs	500,000	711,200(+42%)	511,750
Paracetamol Tabs	4,311,777	1,919,400(56%)	2,311,950

The last twelve months' CMS average consumption for 21 tracer drugs is shown in the "Summary of Stock Analysis" table (below). The data for the past twelve months would seem to indicate that demand has recovered somewhat for four of the five items, compared with the RFF 1992 data, though it is still lower than 1991 for the same four items.

Ordering Process

CMS does not directly order drugs, the orders are placed by the Ministry of Health, as described in the prior section on Procurement. CMS does provide stock information which is used to develop the orders and tenders.

Receiving Process

Once GSC has cleared drug shipments at the port of entry, and necessary fees are paid, shipments received at CMS are checked against order documents and packing slips. A quantitative and qualitative assessment is then performed by the CMS receiving department.

In the case of short shipments or damaged items, a report is filed and submitted to the GSC for claims. Claims have increased in the past two years.

Number of Claims Filed with Vendors

<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993 to date</u>
2	1	5	5

The GSC handles the claims process, and charges an 8% fee for the service, this seems high, and it is unclear why this should be higher than the 4% procurement service fee. A claim usually takes almost a year before being completed, and in the past the amount reimbursed has reportedly been taken *in toto* by the GSC to reduce outstanding CMS debt.

Processing of Requisitions and Issues

Requisitions are submitted more or less quarterly by receiving facilities, with no formal schedule. The requisitions are usually submitted in person by the RMS or health facility, containing the following information:

- Quantity used during the past 12 months
- Quantity in stock
- Quantity required for the next four months
- Quantity requested

Requisitions are sent to Accra for approval by the Chief Pharmacist at the MoH, and are then brought to the Tema store for the preparation of a pro-forma invoice using the current Ministry of Health Price list (the 1993 list is not yet out). This process seems a bit cumbersome, and hopefully once CMS computerizes effectively the invoicing process can be handled directly by CMS.

Since the 1992 implementation of the Cash and Carry Programme, all requisitions have to be paid in full at CMS before any goods can be picked up. The RMS or health facility prepares a check based on the requested quantity and the understanding as to which items requested are in stock.

Due to lack of communications with CMS and the lack of regular information on CMS stock levels, the process does not work smoothly. Often the RMS or hospital staff arrives at CMS with a check for the full amount agreed upon, only to find that CMS cannot in fact supply the full quantities which had been agreed. The procedure to resolve discrepancies varies, some regions leave the balance of funds on deposit with CMS against future purchases, while others choose to purchase other items not originally ordered. Neither option is ideal from the receiving facility point of view.

TRANSPORT AND COMMUNICATIONS

The CMS vehicle fleet includes six trucks which are solely used to transport goods from the harbor to the CMS. In theory the CMS should deliver to facilities but this is never done, due to reportedly to the potential for security problems during trips, and to the difficulty in getting funds for fuel. Thus, the load has been shifted to the consuming facilities, which have to organize their own pick-up, using whatever vehicle may be available and using regional or facility funds for fuel costs.

The CMS has three telephone lines but communications are difficult, due partly to lack of reliability in the telephone service to CMS. Facilities and the CMS communicate using hand held radio transmitters (Motorola). Communications are still inconsistent, however, due largely to the variable presence of key staff at CMS, which means that even if the regions or hospitals manage to reach CMS by telephone or radio, the person they need to speak with may not be there.

The transport and fuel cost load on the regions and hospitals has been increased by the difficulty in communicating with CMS, because in many cases, two trips must be made to Accra: a first to find out what items are in stock, and a second to bring payment and hopefully pick up the items ordered.

CMS Management Information System

When the receiving process and issues are completed they are recorded on a tally card in the storeroom and on the store ledger. During our visit only the tally cards had been kept up to date. This was attributed to an audit that was performed in February 1993, since the ledgers were kept by the auditors during the audit.

In January of 1992, CMS received computer equipment valued at US\$40,000.00 through the World Bank, including

- (1) 80486 Server with a 320MB hard drive, 8MB RAM and a VGA monitor
- (6) 80286 Workstations with a 5¼" high density floppy drive, no hard drive and a monochrome monitor
- (2) Wide carriage dot matrix printers
- (7) Narrow carriage dot matrix printers
- (1) Uninterrupted power supply

All of these units have an ethernet card to form a Novell Local Area Network (LAN). DOS 5.0 and Novell 3.1 software were pre-loaded before the shipment of the units, but no manuals for the use of these systems were received. No applications software were installed or sent with this computer equipment.

A February 1993 report on CMS operations by Computel (a local computer firm) offered a proposal for CMS and regional computerization. Their proposal suggested that Computel could develop an inventory management system, no details of a proposed system design were submitted, and their suggestions for such a system are vague. Their comments on cost recovery and financial information systems do not demonstrate a full understanding of exactly what software systems are needed in the Cash and Carry Programme.

Their hardware suggestions may be a bit grandiose. Given the current and probable future workload at CMS, the current server capacity of a 320MB drive and 8MB RAM should be plenty. The idea of a tape drive has some merit, but again, given the workload, it should be possible to back up data on floppy disks.

The recommendations for additional personnel seem extravagant, given the minimal workload that now exists. The general tenor of the report is rambling and lacking in specific details, which calls into question whether Computel now has the required expertise to develop needed software systems or to manage the computerization process. We support some of their suggestions, with qualifications.

- We agree that a Novell Network administrator may be needed, at least in the short term. This will be needed when a multi-user inventory system is installed, with periodic assistance to maintain the network. It may not be necessary to add a full time permanent system administrator if local firms can provide necessary support on an interim basis.
- The Regional Medical Stores need computer capability, although we question whether it is necessary or feasible to have two computers in each store.

- We agree that the workstations would be more useful if they had been provided with hard drives. Also, these 286 machines are slow, and the monochrome screens are not conducive to user comfort.

Mr Annan, one of the CMS pharmacists, returned 6 months ago from a computer course in the U K , and has now started to develop a multi-user inventory control system using the database program CLARION as a development tool. The system is now producing reports on CMS stock quantities. Two clerks responsible for drug ledgers are entering all the issues made for each drug since the beginning of the Cash and Carry implementation. The main objective is to monitor the trend of drug consumption during this period.

As noted above, the ledgers are currently quite inaccurate, which could limit the reliability of information produced by the computer system, although the June 14 printout from Mr Annan's program does seem to reflect issues and stock status which more current than the ledgers.

Unfortunately, the clerks are not entering data on the facilities to which issues were made, which misses an important piece of management information which could be put in with little extra effort.

Mr Annan's system is a good start, but several of the more important and more complex inventory management functions have not yet been included in his program, such as

- Average monthly consumption, weighted for stock-outs
- Stock out reports
- Date of expiry
- Facilities to which drugs were issued
- Cost of drugs and price lists
- Value of each shipment
- Processing of receipts and issues to produce receiving slips and invoices
- Computation of re-order quantity

It is unclear how long it would take to develop and de-bug a full inventory system, in our experience it is several months at least, with many problems along the way.

Reports from CMS

The CMS has in the past provided an irregular "Monthly Drug Bulletin," with CMS stock level and expiry date (which was produced on a typewriter or word-processor). According to our information, these reports were only occasionally produced. Distribution to consuming facilities has been far from regular, according to both the 1992 Regional Fact Finding Exercise, and the 1993 Regional Survey. Most regional medical stores and health facilities reported receiving no more than one CMS bulletin in the past year, and in most cases none.

Mr Annan's software is now producing a report showing the CMS stock status, as noted it soon will be able to report on CMS issues (without showing the receiving facility). These computer reports are submitted to the Director of Supply and Procurement at the MoH and the Director of the Pharmacy Division, so far they have not been forwarded to the regional medical stores or teaching hospitals.

EXPIRED DRUGS AT CMS AND IN THE REGIONS

The Regional Fact Finding Exercise in May, 1992 found that substantial quantities of drugs had expired in stock, both at CMS and in the regions and districts

10 Regions c346,377,395 or 23% of total stock value
 CMS c25,301,000 or 1 2 % of total stock value

We did not find any of the 26 tracer items expired in stock at CMS, though as discussed below five drugs are apparently at risk of expiry due to excessive stock levels in relation to consumption

<u>Item</u>	<u>Stock Level (Months)</u>	<u># Months to First Expiry Date</u>
Chloroquine	15	15
Folic Acid/Iron	85	31
Frusemide	45	45
Penicillin (Benzyl)	45	23
Tetanus Vaccine	35	16

The benzyl penicillin stock level may be an artifact, due to prolonged stockout, which makes the average consumption invalid

The table on the following page provides a "Summary of Expired Drugs" from the regional survey

Ghana Regional Survey

Summary of Expired Drugs

	Number Expired Drugs	Qty Expired Drugs (Tabs)	Value Expired Drugs (Cedis)*
Regional Medical Stores			
Brong Ahafo	1	41,000	58,630
Greater Accra	0	0	0
Northern	2	330,000	360,000
Volta	2	2,049	14,700
Western	0	0	0
<i>Grand Totals, RMS</i>	5		433,330
Facilities			
Brong Ahafo			
Regional Hospital	2	81,000	243,000
District Hospital	4	25,500	46,500
Facility 1	0	0	0
Facility 2	0	0	0
Greater Accra			
Regional Hospital	2	9,500	161,000
District Hospital	2	10,000	50,000
Facility 1	0	0	0
Facility 2	0	0	0
Northern			
Regional Hospital	3	645,000	4,793,000
District Hospital	2	5,000	123,000
Facility 1	1	6	63
Facility 2	4	15,400	10,000
Volta			
Regional Hospital	1	1	500
District Hospital	0	0	0
Facility 1	0	0	0
Facility 2	0	0	0
Western			
Regional Hospital	2	49,000	0
District Hospital	0	0	0
Facility 1	0	0	0
Facility 2	0	0	0
<i>Grand Totals, Facilities</i>	23		6,293,723

*Value of Expired Drugs is Based on Selling Price

Twenty-three batches of expired drugs were found, in three regional medical stores and ten facilities, the total value was 6.3 million Cedis. Since we don't have total stock values for these facilities, we don't know what percentage of total stock was expired, but it would seem to be less than the 23% found in the Regional Fact Finding Exercise.

In most countries, expiry problems are due to inadequate monitoring of stock status, poor quantification of needs and inappropriate order quantities.

Since the advent of Cash and Carry, regions and facilities who pay for drugs are more cautious in inspecting expiry dates of CMS-supplied items, and refuse to take items which are expired or near expiry. Still, sixteen of twenty-five facilities visited had expired drugs in stock.

According to a 1992 MoH memo, 23 expired items in stock at CMS were tested for potency and, based on the tests, were authorized for distribution by the CMS, it is unclear which laboratory certified these drugs or whether the drugs were used by health facilities.

Stock Analysis at CMS, RMS and Health Facilities

The table on the following page, entitled "Summary of Stock Analysis, Drugs," compares six indicators which measure stock management practices, information is shown for CMS and each of the RMS and health facilities visited.

The percentage of variation between tally cards and actual stock, and ledger and actual stock, are weighted average variations. This means that the percentage reflects the difference between the total number of units on hand for all drugs and the total number of units recorded for those drugs.

The average stock level is computed by dividing the total consumption of a drug, between June 1992 and June 1993, by the average monthly consumption, considering time out of stock during that twelve month period.

The percentage of tracer drugs is the number of tracer drugs found with any stock, divided by the total number of tracer drugs (21).

The average percentage of time out of stock is the total number of days out of stock between June 1992 and June 1993, divided by 365.

Ghana Regional Survey

Summary of Stock Analysis, Drugs

	% Variation Tally/Actual	% Variation Ledger/Actual	Average Stock Level (months)	% of 21 Tracer Drugs in Stock	Average % of Time Out of Stock
Central Medical Stores	0 0%	14 6%	14 3	100 0%	8 0%
Regional Medical Stores					
Brong Ahafo	14 0%	22 8%	5 4	95 0%	13 6%
Greater Accra	0 0%	0 0%	3 0	81 0%	0 0%
Northern	0 4%	0 5%	48 0	76 0%	3 7%
Volta	0 0%	0 0%	9 0	86 0%	14 8%
Western	0 0%	0 0%	8 0	95 0%	3 5%
<i>Averages</i>	2 9%	4 7%	14 7	87 0%	7 1%
Facilities					
Brong Ahafo					
Regional Hospital	3 8%	11 6%	3 7	86 0%	8 1%
District Hospital	NA	24 4%	1 6	71 0%	16 1%
Facility 1	0 0%	0 2%	1 3	38 0%	10 0%
Facility 2	NA	15 7%	3 3	38 0%	34 1%
Greater Accra					
Regional Hospital	39 9%	39 9%	1 4	62 0%	21 7%
District Hospital	65 9%	65 9%	1 8	81 0%	19 6%
Facility 1	NA	39 0%	3 5	71 0%	8 7%
Facility 2	0 0%	10 7%	5 1	48 0%	18 5%
Northern					
Regional Hospital	0 0%	1 4%	12 2	52 0%	8 7%
District Hospital	7 2%	0 0%	8 9	86 0%	5 3%
Facility 1	0 0%	0 0%	5 3	48 0%	0 7%
Facility 2	0 0%	2 7%	9 5	71 0%	7 5%
Volta					
Regional Hospital	0 0%	NA	12 2	90 0%	1 2%
District Hospital	0 0%	0 0%	2 6	57 0%	0 0%
Facility 1	0 0%	0 0%	3 1	33 0%	0 0%
Facility 2	0 0%	0 0%	2 4	33 0%	0 0%
Western					
Regional Hospital	24 0%	27 4%	1 5	57 0%	30 3%
District Hospital	11 4%	8 7%	5 2	86 0%	1 4%
Facility 1	35 7%	35 7%	1 0	57 0%	1 8%
Facility 2	4 7%	17 5%	2 5	43 0%	16 6%
<i>Averages</i>	11 3%	15 8%	4 4	60 0%	10 5%
<i>Averages, Regional Hospitals</i>			6 2	70 0%	14 0%
<i>Averages, District Hospitals</i>			4 0	76 0%	8 5%
<i>Averages, Health Facilities</i>			3 7	48 0%	9 8%

CMS Stock Analysis

All tracer drugs were in stock at the time of our visit, but 15 had a stock level equal to or smaller than 3 months, and 8 of those had a stock level equal to or smaller than 1 month. These drugs could be expected to be in short supply soon. The average stock level was 14.3 months for the twenty-one tracer drugs. On average, the tracer drugs were out of stock 8% of the time between June 1991 and June 1992.

For ten of the tracer drugs, the tally card matched the physical count, for those that did not match, the variation ranged from 0.4% to 12%. Seven items have more stock than shown on the tally card, while nine have less stock than indicated on the tally card. The weighted average variation of 0% shows the tally cards are for the most part regularly updated, and are currently the most accurate CMS record with respect to actual stock.

None of the ledger records matched the physical count. The ledger books were held for auditing purposes for a long period of time, and therefore had not been updated. The weighted average variation between ledger count and actual stock was 14.6%, with a variation range from 3% to 11,868% (for mebendazole). Eight items showed a variation of over 100%. In all but one case (chlorpheniramine) the actual stock was lower than the ledger figure, as might be expected due to the delays in posting.

Some CMS staff expressed the opinion that it would be too difficult to actually count the twenty-one tracer drugs, which leads us to question how often physical stock counts of all stock are done.

Regional Medical Stores and Health Facilities

The table on the following page, "Summary of Stock Analysis, Drugs," compares six indicators of stock management for CMS, the Regional Medical Stores, and health facilities. The CMS findings are discussed in detail above.

The most important indicator of a logistic system's effectiveness is the presence of essential drugs in health facilities where they are needed, this is indicated by the percentage of tracer drugs in stock. In Ghana, at the regional medical stores the average was 87% of tracer drugs in stock, and it fell to an average of 60% at the twenty health facilities (70% in regional hospitals, 76% in district hospitals, and 48% in health centers). These findings illustrate the problems with transport and distribution in the Ghana logistics system.

The percentage of time tracer drugs were out of stock in a twelve month period can be a good indicator of the logistics system performance over time. In Ghana, the percentage of time out of stock at the five regional medical stores was 7.2% on average, and for the twenty health facilities, the average was 10.5% (range 0% to 30.3%).

The following table shows the drugs which staff at RMS and health facilities reported were frequently out of stock from the CMS system.

GHANA REGIONAL SURVEY

DRUGS REPORTED AS CHRONICALLY UNAVAILABLE THROUGH CMS SYSTEM

DRUG	Number of Reports	Percentage of Sites Reporting Problem
Ampicillin Injection	2	8%
Amoxicillin Capsules	6	24%
Amoxicillin Suspension	5	20%
Anti-snake venom	4	16%
Benzylpenicillin Injection	5	20%
Chloramphenicol Capsules	2	8%
Chloramphenicol Injection	5	20%
Chloroquine Injection	3	12%
Chloroquine Tablets	2	8%
Chloroquine Syrup	1	4%
Co-trimoxazole Suspension	4	16%
Diazepam Injection	1	4%
Epinephrine Injection	1	4%
Flucloxacillin Capsules	2	8%
Flucloxacillin Suspension	2	8%
Furosemide Tablets	1	4%
Gentamicin Injection	3	12%
Halothane	1	4%
I V Fluids	5	20%
Ibuprofen Tablets	3	12%
Ketamine Injection	1	4%
Mebendazole Tablets	1	4%
Metronidazole Injection	1	4%
Metronidazole Tablets	2	8%
Multiple Vitamins Tablets	1	4%
Multiple Vitamins Syrup	1	4%
Nitrofurantoin Tablets	1	4%
Nystatin Pessaries	1	4%
Oral Rehydration Salts	5	20%
Paracetamol Tablets	4	16%
Paracetamol Syrup	4	16%
Pethidine Injection	2	8%
Piperazine Citrate Elixir	2	8%
Prednisolone Tablets	1	4%
Promethazine Injection	1	4%
Promethazine Syrup	2	8%
Rabies Vaccine	3	12%
Tetracycline Capsules	1	4%
Thiopentone Injection	4	16%
Vitamin B Complex	1	4%

40 Drugs

Forty drugs were reported by one or more RMS or health facility as being chronically unavailable through the CMS system, most of these drugs could be expected to be high use items (and 13 were included in our list of 21 tracer drugs)

Given this, it is unclear why the reported percentage of time out of stock was not higher at CMS and at the facilities for the tracer drugs. This may be a function of the difficulty in accurately determining how many days an item was actually out of stock.

The nature of the drugs which are reported as being hard to get from the CMS system may explain the high percentage of private sector purchases at some facilities.

The average variation between stock records and physical stock count is a useful measure of the accuracy and currency of the inventory record system, and can be at least an indirect indicator of the potential for leakage from the system. In warehouses in developed countries, an average inventory variation of greater than 1% would be cause for alarm, in developing country systems, acceptable norms are less clear, but an average variation lower than 5% may be a reasonable goal. In Ghana, we have data from three levels of the system. As noted, at CMS, the tally cards were accurate, with an average variation of 0%, while the ledgers showed a variation of 14.6%. At the five regional medical stores, the average variation was 2.9% for tally cards and 4.7% for ledgers. At health facilities, the performance was worse, with average variations of 11.3% for tally cards and 15.8% for ledgers, some health facilities maintain only one of the two record systems.

It is unclear whether or not the variations in records reflect stock losses or sloppy (or untimely) record keeping, if they are losses however, this would be another factor threatening the survivability of the Cash and Carry Programme, because few of the facilities are charging a markup adequate to make up for significant losses in addition to the drugs given free to patients and staff.

Recommendations for Drug Supply System

1 Study to determine future structure of the MoH drug supply system

We concluded that it seems very unlikely that the CMS system can be made to function properly, given existing constraints. The Ministry of Health has expressed interest in investigating the options for changing and perhaps privatizing the MoH drug logistics system, and has approached the government of the Netherlands to support a feasibility study. We suggest that this should be done as quickly as is feasible.

There are several alternatives to the current distribution system. Any of the options below could work if committed people are involved, none will work if staff and management are not committed. The key is that people must be made responsible for performance, just as in a private business, because the Cash and Carry Programme is in fact a federation of small quasi-independent businesses.

Based on our observations, the least disruptive and perhaps most effective way to improve the Ghana drug supply system would be to change to a decentralized system. Such a system could be based on local tenders negotiated by the Ministry of Health and Ghana Supply Commission, using estimates (not guarantees) from the districts and regions, and on the ability of regional medical stores and health facilities to order tender drugs directly from the local suppliers.

We have provided detailed suggestions as to the topics which should be addressed in the "privatization" study in Section 1.6.

2 Development of revised Cash and Carry pricing policy

It is suggested that the Ministry of Health should convene a workshop on pricing policy. This workshop should be held as soon as it is practical in light of the "privatization" study, since the Cash and Carry Programme can survive only if the pricing policies prevent the individual revolving funds from de-capitalizing (which seems to be the case now in at least half of the health facilities we visited).

The workshop should consist of two phases, in the first phase (lasting three to four weeks), central, regional and district representatives should bring complete details on each of the Cash and Carry funds, including Central Medical Stores, each regional medical store, and each facility in the regions (presenting information compiled from Cash and Carry reports).

The second phase of the workshop should be a meeting of senior managers from the MoH, regions, and districts. Participants should include senior MoH staff, regional directors, district management, regional pharmacists and Cash and Carry Coordinators, and any other officials who would provide valuable input into the pricing policy. This group would review the data and recommendations prepared by the working group, and determine what percentage of transport and operating costs should be covered in markups, and what pricing policies should be applied at each level of the system in order to sustain the Cash and Carry Programme.

Our suggestions for the organization of the workshop are found in Section 1.6.

3 Development of decentralized needs quantification and prioritization

Prior to the next tender cycle, training will be needed in quantification methods for those personnel in districts and regions who will be responsible for assembling needs projections, and for managers who will compile and analyze the estimates.

We support the idea that the Cash and Carry Regional Coordinators should be used as primary resources in decentralizing quantification. Access to computers will be crucial if the regional coordinators are to successfully compile data from various districts and sub-districts in the region in any reasonable time frame. Similarly, it is very important that the MoH should have a senior staff member who has knowledge of quantification and access to a computer to compile data and prepare reports. This person should be responsible for managing the quantification process (after appropriate training), as well as establishing a procurement information system.

Our detailed suggestions for training and for managing the next quantification are found in Section 1.6.

4 Installation of inventory management software, and intermittent technical assistance to regional medical stores and MoH in supply management

If the Central Medical Stores is retained in the drug distribution system in any role, a network-compatible inventory management program should be installed (since network hardware and a Novell operating system have already been purchased) If regional medical stores are to play a pivotal role in distribution of drugs and consumables, their inventory management systems should be computerized The inventory management programs for RMS would not need to be network compatible, but would need to be able to communicate with a system installed at CMS at least by diskette, if not modem

CMS has adequate hardware in place, each regional medical store would need the following minimum hardware

- 386 or 486 DOS compatible computer, with at least 4MB RAM and 200MB hard drive and two floppy drives (5 25" and 3 5")
- VGA color monitor
- Dot matrix or laser printer
- Uninterrupted power supply and surge protectors
- Small generator in stores which do not have reliable power (if any)

Ghana should almost certainly attempt to find inventory management software which has already been developed and tested, either through donors or commercial purchase Many developing countries have now installed computers and inventory management systems in their medical stores, and one of these systems should be suitable for Ghana It is not recommended that Ghana develop its own software program, this is not because it cannot be done, but because the time required to develop, test and de-bug an adequate program is long, and (in most cases) involves many problems along the way

There are tested inventory systems which could be made available for little or no cost to the government, given the opportunities for donor participation These systems could be installed in Ghana quickly, this may be preferable to purchasing a commercial system, but this is true only if arrangements are made for local support of the system in the future

5 Future financing options for foreign procurement

A way must be found to address the problem of foreign exchange access for purchasing drugs and other essential items which are not produced locally The World Bank loan funds for external drug procurement will apparently be exhausted with the 1994 tender cycle, assuming the same level of purchases as this year The last time MoH relied on government funds for external purchases, it took about two years to assemble the necessary funding One option would be to consider using UNIPAC or other non-profit procurement agencies for foreign purchases, if a way could be found to fund foreign purchases through a donor, with payment made by MoH or regions in Cedis Another consideration is taking a very hard look at which drugs are purchased externally, it is possible that some drugs which are imported could be replaced by locally made therapeutic substitutes Finally, MoH could purchase the drugs through local importers, doing a mini-tender for drugs only available internationally This would almost certainly lead to higher unit prices, but that might be better than prolonged stockouts (or emergency purchases from the same importers)

A related issue is payment of duty on foreign purchases, a case could be made that the MoH should not pay duty on drugs used in the public service. Certainly there are many countries, if not most, where the MoH does not pay duty. However, this change may not be politically possible in Ghana. It probably would be opposed by the private sector if relief is only given to the public sector, but if a change could be made, this would be beneficial to the Cash and Carry Programme.

6 Nature of tender contracts

The MoH and Ghana Supply Commission should consider changing from the current tender system, which guarantees a fixed quantity with one large shipment, to one in which the annual quantities are estimated (as reliably as possible) and orders are placed as needed by the regional stores. This should be feasible at least for locally produced drugs, since Cash and Carry funds are readily accessible.

Tender contracts should specify the pharmacopoeial standard(s) which are acceptable, and should specify pharmacopoeial standard packaging suitable for tropical conditions. Batch certificates and analyses should be requested from all suppliers for all drugs (rather than doing this occasionally as is the current practice).

Finally, the contracts should provide for penalties if the vendor fails to live up to the contract, and they should be enforced. These do not necessarily have to be performance bonds, if the usual terms were draw-down rather than single quantity, MoH would have the option to refuse to pay for drugs shipped (if on credit) or switch to another supplier (local or foreign).

7 Reduce staff consumption of drugs

In many of the facilities surveyed in this assessment, staff consumption is a significant part of drug expenditures, and represents most (in some cases all) of the free drug issues. The regions, districts and individual health facilities should explore ways to reduce staff drug consumption. One option would be to modify and apply the model employed by the Regional Cash and Carry Programme Coordinator in 1990 in Greater Accra.

8 Senior staff presence at CMS

We suggest that CMS would operate more smoothly if ways can be found to increase the visibility of managers at CMS, and if key staff can find ways to spend more time on the premises. Even though the workload is erratic, it is a double transport expense when RMS and hospitals have to visit CMS to see what is in stock before they order.

9 Reporting

It would be beneficial to the whole logistics system if the central office responsible for coordinating procurement received regular quarterly and annual reports on consumption of drugs in each district and region. Likewise, the Regional Medical Stores need copies of drug returns to help plan orders properly. This information apparently now stops at the Regional Administration, perhaps Cash and Carry Coordinators could compile and transmit information to appropriate offices (this would be helped if they had computer access)

CMS should regularly produce monthly stock reports, and the MoH should make sure that they get to each RMS and teaching hospital each month. These reports should include the current CMS stock levels (including expiry dates), the current price, a summary of issues to each regional medical store and hospital, and a list of items on order and recently received.

The MoH should discuss the need for regular reports with the Ghana Supply Commission, and obtain monthly updates, and quarterly and annual summaries, from the GSC database.

10 Procurement Committees

It is suggested that Procurement Committees, with approval authority for all drug purchases, should be mandatory at each institution which has a Cash and Carry Programme. This would lessen the possibility of wastage of funds on unnecessary purchases, and potentially would give staff and patients more confidence in the Cash and Carry Programme.

2.2. Procurement and Distribution

Overview of Ministry of Health Contraceptive Procurement and Distribution System

The Ministry of Health estimates contraceptive prevalence in Ghana at 8-10%, most family planning supplies are provided by donors, principally USAID and the United Nations Family Planning Agency. USAID is the largest donor, since 1970 it has supplied contraceptives and technical assistance. USAID programs now support MoH family planning and to the private sector, through the Ghana Social Marketing Program (which is assisted by a USAID-supported technical assistance project - the Ghana Family Planning and Health Project). The world-wide Family Planning Logistics Management Project (FPLM) has provided periodic technical assistance, and is responsible for coordinating USAID procurement of commodities for the Ghana MoH family planning program.

The majority of contraceptive distribution and sales in Ghana takes place through programs such as the Ghana Social Marketing Program and Planned Parenthood, rather than the MoH.

The MoH division responsible for managing contraceptives is the Maternal and Child Health/Family Planning Division (MCH/FP). Ms. Victoria Assan is responsible for coordination of family planning logistics in the Ministry.

Central Medical Stores has a separate storage area for managing contraceptives (the "Unicef storeroom," and UNFPA has provided an expatriate advisor to assist in planning and evaluation of family planning activities. The advisor left due to expiry of his contract while we were in Ghana.

Regional MCH/FP divisions are responsible for coordinating family planning in the regions, and the District Health Management Team is responsible at the district level. There are no personnel at the district or facility level who are exclusively responsible for managing contraceptive logistics, this is usually done by a family planning nurse.

Mr. Tim Rosche of the FPLM project did an evaluation of the Ministry of Health family planning logistics system in February of 1993, his report has detailed observations on the problems in the family planning logistics system and recommendations to solve the problems. We did not attempt to duplicate his effort, and this section will not attempt to provide an in-depth analysis of the contraceptive distribution system.

We included three family planning commodities (condoms, Depo-Provera and Lo-Femenal) in our set of tracer drugs, and this section reports on the status of those drugs in the regional medical stores and health facilities visited. We also assembled reports on procurement of MoH commodities based on information provided by Mr. Rosche, and held discussions with various officials concerning the feasibility of integrating family planning commodities into the larger MoH logistics system, given our findings related to that system.

Procurement of MoH Family Planning Commodities Financed by USAID

The tables on the following two pages show the shipments of USAID-financed family planning commodities received by the Ministry of Health and by the Ghana Social Marketing Program between January 1990 and June 1993.

Contraceptives, Ghana Ministry of Health

Shipments On or After 1/1/90

Item	Qty Shipped	Value	Date Rcvd
52mm Non Colored, No Logo	2,280,000	\$111,242 00	6/16/91
	720,000	\$39,878 00	6/15/91
Totals	3,000,000	\$151,120 00	
52mm Non-Colored, No-Logo	1,740,000	\$100,625 00	4/21/93
	264,000	\$19,413 00	4/21/93
Totals	2,004,000	\$120,038 00	
Conceptrol Foaming Tablet	1,473,600	\$138,802 62	2/5/92
	446,400	\$43,971 33	2/19/92
	652,800	\$65,236 80	5/4/93
Totals	2,572,800	\$248,010 75	
Copper T, 380	7,000	\$8,169 75	7/11/91
	15,000	\$14,913 75	1/30/92
	15,000	\$18,618 75	2/5/92
	8,000	\$11,304 16	11/23/92
	8,000	\$10,107 20	5/14/93
Totals	53,000	\$63,113 61	
Lo-Femenal, Blue Lady	111,600	\$16,575 35	1/17/91
	572,400	\$82,933 11	3/15/91
	432,000	\$59,298 00	9/15/91
	432,000	\$67,813 80	2/5/92
	420,000	\$63,946 00	4/2/93
Totals	1,968,000	\$290,566 26	
Norplant	200	\$5,256 79	3/18/92
Totals	200	\$5,256 79	
Ovrette	24,000	\$4,347 60	1/30/92
	26,400	\$6,778 68	400 short 2/9/93
	15,600	\$4,767 97	in port
Totals	66,000	\$15,894 25	
<i>Grand Total</i>		\$893,999 66	

Contraceptives, Ghana Social Marketing Program

Shipments On or After 1/1/90

Item	Qty Shipped	Value	Date Rcvd
52mm Colored Panther	996,000	\$46,921 95	5/29/90
	1,008,000	\$48,694 96	7/24/90
Totals	2,004,000	\$95,616 91	
52mm Non Colored Blue/Gold	1,200,000	\$59,060 00	2/15/91
	750,000	\$40,575 00	8/26/92
	750,000	\$40,575 00	8/26/92
Totals	2,700,000	\$140,210 00	
52mm Non-Colored Panther	504,000	\$30,514 98	4/19/90
	498,000	\$29,554 23	5/9/90
	3,252,000	\$155,735 30	2/15/91
	600,000	\$34,746 90	1/8/91
	9,498,000	\$455,395 95	4/15/91
	2,250,000	\$120,376 00	in port
Totals	16,602,000	\$826,323 36	
52mm Non-Colored Blue/Gold	750,000	\$52,948 00	in port
Totals	750,000	\$52,948 00	
Flower Foaming Tablet	652,800	\$64,254 56	7/15/91
	724,800	\$73,596 78	10/22/91
	1,248,000	\$124,071 60	5/15/92
	3,254,400	\$319,020 34	8/26/92
	1,286,400	\$125,605 10	7/13/92
	1,968,000	\$189,189 62	8/6/92
	2,001,600	\$187,150 60	in port
Totals	11,136,000	\$1,082,888 60	
Norminest FE	84,000	\$23,580 21	3/22/90
	240,000	\$65,820 00	8/2/90
	262,800	\$74,163 00	5/6/91
Totals	586,800	\$163,563 21	
Norquest	200,400	\$54,350 66	5/15/91
	127,200	\$33,499 74	5/15/92
	408,000	\$106,458 60	5/15/92
	570,000	\$153,250 25	8/26/92
	334,800	\$89,906 53	7/16/92
	250,800	\$71,352 60	4/5/93
Totals	1,891,200	\$508,818 38	
<i>Grand Total</i>		\$2,870,368 46	

It can be seen that the value of contraceptives shipped to the Ghana Social Marketing Program is more than three times that shipped to the Ministry of Health, which is in keeping with the relative scopes of the two distribution systems

In order to prepare orders for Ministry of Health contraceptives, each Regional Principal Nursing Officer prepares a quarterly report on clinic issues and balance on hand, this is compiled manually by the Ministry of Health MCH/FP division into a quarterly Contraceptive Needs Assessment, showing clinic issues in the past quarter, the stock balances at clinics, district stores and regional stores, the expected stock level, based on orders in the pipeline and average monthly consumption, and the quantity needed and issued

This system was designed by FPLM and it is sound in principle, but there may be some problems with the accuracy of compiled information Mr Rosche gave us a copy of the Contraceptive Needs Assessment for each item for the second quarter of 1993, and we converted the data into a single spreadsheet which is found on the following page

We found that the manual reports (found in the Annexes) had several errors in addition, this is indicated by the spreadsheet columns "Total on Sheet" and "True Total " Some of these errors were substantial, which create corresponding errors in the calculation of "Quantity Needed " This is not to say that the system design is faulty, but that more care is needed when computing (and checking) the totals This sort of report would be much more easily done on a spreadsheet if the equipment and training could be provided to the officer responsible for compiling information at the Ministry

Contraceptives Needs Assessment, Quantity Issued & Balance in Central Medical Stores, Ghana

Region	Clinic Issues	Balance in Stock				Expected Stock Level					Actual Need	Qty. in CM	Qty. Issued
		Clinic Store	District Store	Reg. Store	Total on Sheet	True Total	Clinic Store	District Store	Reg. Store	Total on Sheet			
Conceptrol (1 carton=4800 Tablets)													
BAR	34459	15149	48900	65200	129249	45945	68918	103377	218240		88991		24000
Eastern	9356	9901	33148	4800	47849	12475	18712	28068	59255		11406		
GAR	5721	1744	6300	2400	10444	7628	11442	17163	36233		25789		12000
UE	3231	3883	2500	4800	11183	4308	6462	9693	20463		9280		
Ashanti	25935	12534	39300	63300	115134	34580	51870	77805	164255		49121		48000
Northern	5614	4110	3000	10000	17110	7485	11228	16842	35555		318445		
Volta	31077	48301	28300	71400	148001	41436	62154	93231	196821		48820		24000
Central	41963	41726	73780	105800	221306	55951	83926	125889	265766		44460		43200
UWR	236	1204	1760	1600	4564	315	472	708	1495		0		0
Western	11680	6426	14620	41100	62146	15573	23360	35040	73973		11827		9600
Total	169272				766986								
Copper T 380A (1 carton=200 units)													
BAR	375	507	975	935	2417	500	750	1125	2375		0		0
Eastern	352	203	408	1425	2036	469	704	1056	2229		193		200
GAR	1136	583	700	200	1483	1515	2272	3408	7195		5712		5800
UE	194	253	150		403	259	388	582	1229		826		800
Ashanti	712	702	1702	2250	4654	949	1424	2136	4509		0		
Northern	355	384	331	220	935	473	710	1065	2248		1313		2400
Volta	148	373	382	495	1250	197	296	444	937		0		
Central	177	475	258	880	1613	236	354	531	1121		0		
UWR	161	319	294	120	733	215	322	483	1020		287		
Western	68	182	156	0	338	91	136	204	431		93		0
Total	3678				15862								
2nd Quarter 1993													
Lo-Femeral (1 carton=1200 cycles)													
BAR	34229	8158	22650	91700	122508	45639	68458	102687	216784		94276		42000
Eastern	11993	3692	25900	10400	39992	15991	23986	35979	75956		35964		
GAR	7344	10281	18100	2400	30781	9792	14688	22032	46512		15731		
UE	12465	4132	6600	15400	26132	16620	24930	37395	78945		52813		
Ashanti	17739	8524	28390	38900	75814	23652	35478	53217	112347		36533		18267
Northern	4454	3517	2367	7200	13084	5939	8908	13362	28209		15125		
Volta	5981	6567	11260	46400	64227	7975	11962	17943	37880		0		
Central	13981	8538	20752	46100	75390	18641	27962	41943	88546		13156		13200
UWR	1164	2632	4105	2100	8837	1552	2328	3492	7372		0		0
Western	4185	3374	6282	4200	13856	5580	8370	12555	26505		12649		13200
Total	113535				470621								

Contraceptives Needs Assessment, Quantity Issued & Balance in Central Medical Stores, Ghana

Region	Clinic Issues	Balance in Stock					Expected Stock Level					Actual Need	Qty. in CM	Qty. Issued	
		Clinic Store	District Store	Reg. Store	Total on Sheet	True Total	Clinic Store	District Store	Reg. Store	Total on Sheet	True Total				
Micronor (1 carton=1200 cycles)															
BAR	261	544	855	1600	2999		348	522	783	1653		0		0	
Eastern	129	420	630	1200	1632	2250	172	258	387	817		0			
GAR	6	174	3340	1200	4714		8	12	18	38		0			
UE	704	1279	1100	0	2379		939	1408	2112	4459		2080			
Ashanti	634	490	1020	2450	3960		845	1268	1902	4015		55			
Northern	427	1553	501	0	2054		569	854	1281	2704		650			
Volta	74	168	615	1390	2173		99	148	222	469		0			
Central	192	243	420	300	963		256	384	576	1216		253		0	
UWR	155	1235	410	100	1745		207	310	465	982		0		0	
Western	450	519	515	1200	2234		600	900	1350	2850		616		1200	
Total	3032				24853										
25471															
Microgynon (1 carton=2640 cycles)															
BAR	3336	1029	1107	7530	9666		4448	6672	10008	21128		11462		7920	
Eastern	0	0	0	5280	5280		0	0	0	0		0		0	
GAR	3147	5782	4278	2640	12700		4196	6294	9441	19931		7231			
UE	308	445	360	4350	5155		411	616	924	1951		0			
Ashanti	634	490	2676	11160	14326		845	1268	1902	4015		0			
Northern	1136	1283	2155	6690	10128		1515	2272	3408	7195		0			
Volta	1439	1605	2275	1281	5161		1919	2878	4317	9114		3953			
Central	1019	913	1079	0	1992		1359	2038	3057	6454		4462		5280	
UWR	751	1465	768	840	3073		1001	1502	2253	4756		1683		2640	
Western	1234	1198	2185	3570	6953		1645	2468	3702	7815		862		0	
Total	13004				74434										
Clinic Issues 1st Quarter 1993															
Sultan (1 carton=6000)															
BAR	111223	28376	76800	36900	142076		148297	222446	333669	704412		562336		60000	
Eastern	85597	44897	62105	161500	268502		114129	171194	256791	542114		273612		36000	
GAR	29881	52831	42500				103995	155992	233988	493975		368112		240000	
	48115	21432	3100	6000	125863	125212									
UE	33802	8908	33300	34800	77008		45069	67604	101406	214079		137071			
Ashanti	147460	42218	108000	150000	300218		196613	294920	442380	933913		633695		44400	
Northern	21570	12745	19600	47818	80163		28760	43140	64710	136610		56447			
Volta	59474	31823	149946	172100	353869		79299	118948	178422	376669		22800			
Central	111500	117220	190865	199900	507985		148667	223000	334500	706167		198182		120000	
UWR	11270	12070	3181	16600	31851		15027	22540	33810	71377		39526		42000	
Western	76805	22890	29780	20000	72670		102407	153610	230415	486432		413762		240000	
Total	625474				1960205	1959554									

Contraceptives Needs Assessment, Quantity Issued & Balance in Central Medical Stores, Ghana

Region	Clinic Issues	Balance in Stock					Expected Stock Level					Actual Need	Qty. in CM	Qty. Issued	
		Clinic Store	District Store	Reg. Store	Total on Sheet	True Total	Clinic Store	District Store	Reg. Store	Total on Sheet	True Total				
Ovrette (1 carton=1200 cycles)															
BAR	250	378	300	700	1378		333	500	750	1583		205		0	
Eastern	0	0	0	2400	2400		0	0	3600	3600		1200		1200	
GAR	1100	2877	750	800	4427		1467	2200	3300	6967		2540		2400	
UE	104	144	200	1200	1544		139	208	312	971	659	0		0	
Ashanti	628	656	830	500	1986		837	1256	1884	3977		1991		2400	
Northern	271	888	500	3200	4588		361	542	813	1716		0		0	
Volta	412	754	881	0	1635		549	824	1236	2609		974		1200	
Central	125	202	296	300	798		167	250	375	792		0		0	
UWR	0	0	0	700	700		0	700	1200	1900		1200		1200	
Western	395	875	30	1200	2105		527	790	1185	2502		397		0	
Total	3285				21561										
Neo Sampoo (1 carton=4000 tablets)															
BAR	85197	16383	40200	0	56583		113596	170394	255591	539581		482998			
Eastern	37160	31452	69660	8000	140564	109112	49547	74320	111480	235347		94783			
GAR	15900	8200	3360	4000	15560		21200	31800	47700	100700		85140			
UE	8120	6720	5600	0	12320		10827	16240	24360	51427		39107			
Ashanti	1381	479	40	0	519		1841	2762	4143	8746		8227		800	
Northern	7820	6600	7240	0	13840		10427	15640	23460	49527		35687			
Volta	16065	15142	68400	52500	136042		21420	32130	48195	101745		0			
Central	18300	5500	7640	2000	15140		24400	36600	54900	115900		100760			
UWR	21385	4121	10980	1680	16781		28513	42770	64155	135438		118657			
Western	23650	19254	16300	0	35554		31533	47300	70950	338983	149783	303429			
Total	234978				442903	411451									
Depo Provera (1 carton=400 doses/vials)															
BAR	5236	4435	9128	800	14363		6981	10472	15708	33161		18798			
Eastern	5183	4410	7861	3200	15471		6911	10366	15549	32826		17355			
GAR	3506	4674	5830	1600	12104		4675	7012	10518	32723	22205	20619			
UE	2173	1536	2180	10300	14014	14016	2897	4346	6519	13762		0			
Ashanti	9920	5027	11000	14600	30627		13227	19840	29760	112427	62827	81800			
Northern	1260	935	873	0	1808		1680	2520	3780	7980		6172			
Volta	3285	7259	9430	5525	22214		4380	9855	19760	33995					
Central	3439	3628	3752	5640	13020		4585	6878	10317	21780		8760		8800	
UWR	1144	13163	1936	1457	16556		1525	2288	3432	7245		0			
Western	1837	1501	2753	12900	17154		2449	3674	5511	17145	11634	0			
Total	36983				157331	157333									

Contraceptive Stock Management

CMS

As discussed above, we included three family planning commodities in the set of tracer drugs. These were condoms, Depo-Provera (medroxyprogesterone acetate injection) and Lo-Femenal (a progestin/estrogen contraceptive tablet).

The stock data on contraceptives at CMS was mostly unremarkable for these items, the average stock level was 3.2 months, Depo-Provera had 6 months' supply at current consumption rates. No stock was expired, and none was in any danger of expiry before use.

Tally cards are the only records used, the weighted average inventory variation was only 1% for the three items as a whole, but there was a fairly large discrepancy for Depo-Provera.

	<u>Tally Card</u>	<u>Actual Count</u>	<u>% Variation</u>
Depo-provera	152,400	136,000	12%

Lo-Femenal was reportedly out of stock for 48 days in the past twelve months (June 30, 1992 to June 1, 1993).

RMS and Health Facility Reports

The six following pages contain a summary spreadsheet on "Contraceptive Stock Analysis," and a set of database reports presenting stock management data on the three items, including

- Actual stock count
- Tally card count at the time of visit (if tally card used)
- Date of last entry on tally card (to measure currency of posting)
- Percentage variation between stock count and tally card
- Ledger count (if ledger used)
- Date of last entry on ledger
- Percentage variation between stock count and ledger
- Total consumption June 1992 to May 30, 1993
- Average monthly consumption, considering time out of stock
- Stock level in months, at average monthly consumption
- Quantity expired in stock (if any)
- Value of expired stock at current selling price

The database reports were produced by SURVEY, the RPM program used to compile information from the regional survey, the summary spreadsheet was extracted from these reports.

Ghana Regional Survey

Summary of Stock Analysis, Contraceptives

	% Variation Tally/Actual	% Variation Ledger/Actual	Average Stock Level (months)
Central Medical Stores	1 0%	NA	3 2
Regional Medical Stores			
Brong Ahafo	0 0%	NA	6 7
Greater Accra	NA	NA	NA
Northern	0 5%	0 5%	NA
Volta	0 0%	0 0%	15 7
Western	0 0%	0 0%	17 3
<i>Averages, RMS</i>	0 1%	0 2%	13 2
Facilities			
Brong Ahafo			
Regional Hospital	NA	5 2%	1 3
District Hospital	70 0%	70 0%	0 0
Facility 1	NA	NA	0 0
Facility 2	25 6%	NA	3 0
Greater Accra			
Regional Hospital	13 8%	NA	2 0
District Hospital	NA	NA	0 0
Facility 1	0 0%	NA	2 0
Facility 2	NA	NA	0 0
Northern			
Regional Hospital	NA	NA	0 0
District Hospital	NA	NA	0 0
Facility 1	NA	NA	0 0
Facility 2	0 0%	0 0%	3 7
Volta			
Regional Hospital	NA	NA	0 0
District Hospital	NA	NA	0 0
Facility 1	0 0%	NA	7 7
Facility 2	54 2%	NA	6 7
Western			
Regional Hospital	0 0%	4 2%	6 3
District Hospital	0 0%	NA	2 7
Facility 1	44 6%	78 6%	0 0
Facility 2	NA	NA	0 0
<i>Averages, Facilities</i>	20 8%	31 6%	1 8

GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS/SUMMARY - ALL REGIONS - CONTRACEPTIVES

DESCRIPTION	REGION/FAC	CURRENT	OFFICIAL	LAST PRICE	LAST PRICE	MARKUP ON	PRIVSEC
		FACILITY SELLING PRICE	MOH PRICE LIST (92)	FROM RMS	FROM DATE PRIVSEC	LATEST PRICE (P SECTOR VS RMS)	PRICE AS A % OF RMS PRICE
Condom DISP	GACC /RHOS	30 00	0 00	0 00	05/01/93	0 00	0 00%
	/FAC1	2 50	0 00	2 50	09/30/93	0 00	0 00%
	VOLT /FAC1	2 50	0 00	2 50	01/05/93	0 00	0 00%
	/FAC2	2 50	0 00	2 50	01/06/93	0 00	0 00%
	WEST /RHOS	2 10	0 00	0 00	06/02/93	0 00	0 00%
	/DHOS	25 00	0 00	0 00	04/22/93	0 00	0 00%
	/FAC1	25 00	0 00	0 00	01/12/93	0 00	0 00%
	/FAC2	0 00	0 00	0 00		0 00	0 00%
	BRAF /RHOS	2 50	0 00	2 50	05/12/93	0 00	0 00%
	/DHOS	5 00	0 00	2 50	06/09/93	0 00	100 00%
	/FAC2	2 50	0 00	2 50	06/02/93	0 00	0 00%
							AVG MARKUP
Depo-Provera BP LIQ	GACC /RHOS	30 00	0 00	0 00	04/01/93	0 00	0 00%
	/FAC1	40 00	0 00	30 00	03/30/92	0 00	33 33%
	VOLT /FAC1	40 00	0 00	40 00	01/05/93	0 00	0 00%
	/FAC2	40 00	0 00	40 00	01/06/93	0 00	0 00%
	WEST /RHOS	40 00	0 00	0 00	06/02/93	0 00	0 00%
	/DHOS	40 00	0 00	0 00	02/04/93	0 00	0 00%
	/FAC1	40 00	0 00	0 00	04/01/93	0 00	0 00%
	/FAC2	0 00	0 00	0 00		0 00	0 00%
	BRAF /RHOS	40 00	0 00	40 00	04/21/93	0 00	0 00%
	/DHOS	150 00	0 00	40 00	06/09/93	0 00	275 00%
	/FAC2	50 00	0 00	40 00	06/02/93	0 00	25 00%
	NORT /FAC2	40 00	0 00	0 00		0 00	0 00%
						AVG MARKUP	55 56%
Lo-Femenal BP PIL 28 PILS	GACC /RHOS	15 00	0 00	0 00	06/01/93	0 00	0 00%
	/FAC1	15 00	0 00	10 00	03/30/93	0 00	50 00%
	VOLT /FAC1	15 00	0 00	15 00	01/05/93	0 00	0 00%
	/FAC2	15 00	0 00	15 00	01/06/93	0 00	0 00%
	WEST /RHOS	15 00	0 00	0 00	04/05/93	0 00	0 00%
	/DHOS	15 00	0 00	0 00	02/04/92	0 00	0 00%
	/FAC1	15 00	0 00	0 00	04/06/92	0 00	0 00%
	/FAC2	0 00	0 00	0 00		0 00	0 00%

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GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS/SUMMARY - ALL REGIONS - CONTRACEPTIVES

DESCRIPTION	REGION/FAC	CURRENT	OFFICIAL	LAST PRICE		MARKUP ON		PRIVSEC
		FACILITY SELLING PRICE	MOH PRICE LIST (92)	FROM	DATE	DATE	VS RMS)	PRICE AS A % OF RMS PRICE
Lo Femenal BP PIL 28 PILS	BRAF /RHOS	15 00	0 00	15 00	04/21/93	0 00		0 00%
	/DHOS	30 00	0 00	15 00	04/01/93	0 00		100 00%
	/FAC2	15 00	0 00	40 00	06/02/93	0 00		-62 50%
							AVG MARKUP	14 58%
							OVERALL AVG MARKUP	28 94%

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GHANA/REGIONAL SURVEY

HEALTH FACILITY STOCK ANALYSIS - CONTRACEPTIVES

DESCRIPTION	ACTUAL COUNT	TALLY CARD	LAST	% VAR	LEDGER	LAST	% VAR	#DAYS STOCK OUT	STOCK LEVEL (MON)	QUANTITY EXPIRED IN STOCK	VALUE OF EXPIRED STOCK	
			TALLY ENTRY	TALLY /ACTUAL		LEDGER ENTRY	LEDGER LAST 12 MT CONSUMPT					AVG/MONTH CONSUMPT
BRONG AHAFO REGION/DHOS/GOASO HOSPITAL												
Condom DISP	300	1 119	06/09/93	73 2%	1 119	06/09/93	73 2%	21 000	0	1 750	0	0
Depo-Provera BP LIQ	30	120	06/09/93	75 0%	120	06/09/93	75 0%	1 250	0	104	0	0
Lo Femenal BP PIL 28 PILS	75	111	05/31/93	32 4%	111	05/31/93	32 4%	7 100	0	592	0	0
Number of Items in Stock	3/3		AVG VARIATION	70 0% (abs)		AVG VARIATION	70 0% (abs)			TOTAL VALUE OF EXPIRED STOCK		0
BRONG AHAFO REGION/FAC1/SANKORE HEALTH CENTRE												
Condom DISP	0	0		0 0%	0		0 0%	0	0	0	0	0
Depo Provera BP LIQ	0	0		0 0%	0		0 0%	0	0	0	0	0
Lo-Femenal BP PIL 28 PILS	0	0		0 0%	0		0 0%	0	0	0	0	0
Number of Items in Stock	0/3		AVG VARIATION	**** *% (abs)		AVG VARIATION	**** *% (abs)			TOTAL VALUE OF EXPIRED STOCK		0
BRONG AHAFO REGION/FAC2/KUKUOM HEALTH CENTER												
Condom DISP	400	500	06/02/93	20 0%	0		100 0%	2 900	30	263	2	0
Depo-Provera BP LIQ	25	34	05/31/93	26 5%	0		100 0%	101	30	9	3	0
Lo-Femenal BP PIL 28 PILS	450	642	06/02/93	29 9%	0		100 0%	1 258	30	114	4	0
Number of Items in Stock	3/3		AVG VARIATION	25 6% (abs)		AVG VARIATION	**** *% (abs)			TOTAL VALUE OF EXPIRED STOCK		0
BRONG AHAFO REGION/RHOS/SUNYANI HOSPITAL												
Condom DISP	0	0		0 0%	0	06/09/93	0 0%	35 000	38	3 255	0	0
Depo Provera BP LIQ	130	0		100 0%	130	04/02/93	0 0%	2 100	0	175	1	0
Lo-Femenal BP PIL 28 PILS	3 500	0		100 0%	3 700	06/08/93	5 4%	12 100	7	1 028	3	0
Number of Items in Stock	2/3		AVG VARIATION	**** *% (abs)		AVG VARIATION	5 2% (abs)			TOTAL VALUE OF EXPIRED STOCK		0
GREATER ACCRA REGION/DHOS/TEMA GENERAL HOSPITAL												
Condom DISP	0	0		0 0%	0		0 0%	0	0	0	0	0
Depo Provera BP LIQ	0	0		0 0%	0		0 0%	0	0	0	0	0
Lo-Femenal BP PIL 28 PILS	0	0		0 0%	0		0 0%	0	0	0	0	0
Number of Items in Stock	0/3		AVG VARIATION	**** *% (abs)		AVG VARIATION	**** *% (abs)			TOTAL VALUE OF EXPIRED STOCK		0

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GHANA/REGIONAL SURVEY

HEALTH FACILITY STOCK ANALYSIS CONTRACEPTIVES

DESCRIPTION	ACTUAL COUNT	TALLY CARD	LAST	% VAR	LEDGER	LAST	% VAR	#DAYS STOCK OUT	AVG/MONTH CONSUMPT	STOCK LEVEL (MON)	QUANTITY EXPIRED IN STOCK	VALUE OF EXPIRED STOCK
			TALLY ENTRY	TALLY /ACTUAL		LEDGER ENTRY	LEDGER /ACTUAL					

GREATER ACCRA REGION/FAC1/TEMA URBAN HEALTH

Condom DISP	12 000	12 000	05/06/93	0 0%	0	100 0%	90 000	40	8 420	1	12 000	30 000
Depo-Provera BP LIQ	1 800	1 800	05/10/93	0 0%	0	100 0%	6 000	0	500	4	0	0
Lo-Femenal BP PIL 28 PILS	1 200	1 200	05/06/93	0 0%	0	100 0%	10 800	0	900	1	0	0
Number of Items in Stock	3/3		AVG VARIATION	0 0% (abs)		AVG VARIATION ****	% (abs)				TOTAL VALUE OF EXPIRED STOCK	30 000

GREATER ACCRA REGION/FAC2/

Condom DISP	0	0		0 0%	0	0 0%	0	0	0	0	0	0
Depo-Provera BP LIQ	0	0		0 0%	0	0 0%	0	0	0	0	0	0
Lo-Femenal BP PIL 28 PILS	0	0		0 0%	0	0 0%	0	0	0	0	0	0
Number of Items in Stock	0/3		AVG VARIATION *****	% (abs)		AVG VARIATION ****	% (abs)				TOTAL VALUE OF EXPIRED STOCK	0

GREATER ACCRA REGION/RHOS/RIDGE HOSPITAL

Condom DISP	400	500	06/01/93	20 0%	0	100 0%	13 500	0	1 125	0	0	0
Depo-Provera BP LIQ	48	59	05/03/93	18 6%	0	100 0%	159	0	13	4	0	0
Lo-Femenal BP PIL 28 PILS	249	250	06/01/93	0 4%	0	100 0%	1 200	0	100	2	0	0
Number of Items in Stock	3/3		AVG VARIATION	13 8% (abs)		AVG VARIATION ****	% (abs)				TOTAL VALUE OF EXPIRED STOCK	0

NORTHERN REGION/DHOS/BOLE HOSPITAL

Condom DISP	0	0		0 0%	0	0 0%	0	0	0	0	0	0
Depo-Provera BP LIQ	0	0		0 0%	0	0 0%	0	0	0	0	0	0
Lo-Femenal BP PIL 28 PILS	0	0		0 0%	0	0 0%	0	0	0	0	0	0
Number of Items in Stock	0/3		AVG VARIATION *****	% (abs)		AVG VARIATION ****	% (abs)				TOTAL VALUE OF EXPIRED STOCK	0

NORTHERN REGION/FAC1/TUNA HEALTH POST

Condom DISP	0	0		0 0%	0	0 0%	0	0	0	0	0	0
Depo-Provera BP LIQ	2	0		100 0%	0	100 0%	0	0	0	***	0	0
Lo-Femenal BP PIL 28 PILS	0	0		0 0%	0	0 0%	0	0	0	0	0	0
Number of Items in Stock	1/3		AVG VARIATION *****	% (abs)		AVG VARIATION ****	% (abs)				TOTAL VALUE OF EXPIRED STOCK	0

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GHANA/REGIONAL SURVEY

HEALTH FACILITY STOCK ANALYSIS - CONTRACEPTIVES

DESCRIPTION	ACTUAL COUNT	TALLY CARD	LAST	% VAR	LEDGER	LAST	% VAR	#DAYS STOCK OUT	AVG/MONTH CONSUMPT	STOCK	QUANTITY	VALUE OF
			TALLY ENTRY	TALLY /ACTUAL		LEDGER ENTRY	LEDGER /ACTUAL			LAST 12 MT CONSUMP	LEVEL (MON)	EXPIRED IN STOCK
NORTHERN REGION/FAC2/MOLE HEALTH CENTRE												
Condom DISP	300	300	04/03/93	0 0%	300	04/03/93	0 0%	500	0	42	7	0
Depo-Provera BP LIQ	10	10	04/03/93	0 0%	10	04/03/93	0 0%	100	0	8	1	0
Lo-Femenal BP PIL 28 PILS	91	91	04/03/93	0 0%	91	04/03/93	0 0%	400	0	33	3	0
Number of Items in Stock	3/3			AVG VARIATION 0 0% (abs)			AVG VARIATION 0 0% (abs)			TOTAL VALUE OF EXPIRED STOCK		0
NORTHERN REGION/RHOS/TAMALE REGIONAL HOSPITAL												
Condom DISP	0	0		0 0%	0		0 0%	0	0	0	0	0
Depo-Provera BP LIQ	0	0		0 0%	0		0 0%	0	0	0	0	0
Lo-Femenal BP PIL 28 PILS	0	0		0 0%	0		0 0%	0	0	0	0	0
Number of Items in Stock	0/3			AVG VARIATION ***** % (abs)			AVG VARIATION ***** % (abs)			TOTAL VALUE OF EXPIRED STOCK		0
VOLTA REGION/DHOS/KETA GOVT HOSPITAL												
Condom DISP	0	0		0 0%	0		0 0%	0	0	0	0	0
Depo-Provera BP LIQ	0	0		0 0%	0		0 0%	0	0	0	0	0
Lo-Femenal BP PIL 28 PILS	0	0		0 0%	0		0 0%	0	0	0	0	0
Number of Items in Stock	0/3			AVG VARIATION ***** % (abs)			AVG VARIATION ***** % (abs)			TOTAL VALUE OF EXPIRED STOCK		0
VOLTA REGION/FAC1/ANLOGA HEALTH CENTRE												
Condom DISP	634	634	06/01/93	0 0%	0		100 0%	912	0	76	8	0
Depo-Provera BP LIQ	154	154	06/01/93	0 0%	0		100 0%	192	0	16	10	0
Lo Femenal BP PIL 28 PILS	57	57	06/01/93	0 0%	0		100 0%	143	0	12	5	0
Number of Items in Stock	3/3			AVG VARIATION 0 0% (abs)			AVG VARIATION ***** % (abs)			TOTAL VALUE OF EXPIRED STOCK		0
VOLTA REGION/FAC2/ANYAKO HEALTH CENTRE												
Condom DISP	400	873	03/01/93	54 2%	0		100 0%	446	0	37	11	0
Depo Provera BP LIQ	25	75	03/01/93	66 7%	0		100 0%	138	0	12	2	0
Lo-Femenal BP PIL 28 PILS	26	37	03/01/93	29 7%	0		100 0%	47	0	4	7	0
Number of Items in Stock	3/3			AVG VARIATION 54 2% (abs)			AVG VARIATION ***** % (abs)			TOTAL VALUE OF EXPIRED STOCK		0

GHANA/REGIONAL SURVEY

HEALTH FACILITY STOCK ANALYSIS - CONTRACEPTIVES

DESCRIPTION	ACTUAL COUNT	TALLY CARD	LAST	% VAR	LEDGER	LAST	% VAR	#DAYS STOCK OUT	AVG/MONTH CONSUMPT	STOCK LEVEL (MON)	QUANTITY EXPIRED IN STOCK	VALUE OF EXPIRED STOCK
			TALLY ENTRY	TALLY /ACTUAL		LEDGER ENTRY	LEDGER LAST 12 MT CONSUMP					
VOLTA REGION/RHOS/REGIONAL HOSPITAL HO												
Condom DISP	0	0		0 0%	0		0 0%	0	0	0	0	0
Depo-Provera BP LIQ	0	0		0 0%	0		0 0%	0	0	0	0	0
Lo Femenal BP PIL 28 PILS	0	0		0 0%	0		0 0%	0	0	0	0	0
Number of Items in Stock	0/3		AVG VARIATION ***** % (abs)		AVG VARIATION ***** % (abs)					TOTAL VALUE OF EXPIRED STOCK		0
WESTERN REGION/DHOS/TARKWA HOSPITAL												
Condom DISP	400	400	06/17/93	0 0%	0	04/01/93	100 0%	4 200	0	350	1	0
Depo-Provera BP LIQ	90	90	06/17/93	0 0%	90	04/01/93	0 0%	1 050	0	88	1	0
Lo-Femenal BP PIL 28 PILS	1 120	1 120	06/17/93	0 0%	0	04/01/93	100 0%	2 200	0	183	6	0
Number of Items in Stock	3/3		AVG VARIATION	0 0% (abs)	AVG VARIATION	1688 9% (abs)				TOTAL VALUE OF EXPIRED STOCK		0
WESTERN REGION/FAC1/NSUAEM												
Condom DISP	0	0	04/06/93	0 0%	0	04/06/92	0 0%	6 000	0	500	0	0
Depo Provera BP LIQ	12	20	04/01/93	40 0%	32	01/19/93	62 5%	500	0	42	0	0
Lo-Femenal BP PIL 28 PILS	24	45	04/01/93	46 7%	136	04/06/92	82 4%	2 000	0	167	0	0
Number of Items in Stock	2/3		AVG VARIATION	44 6% (abs)	AVG VARIATION	78 6% (abs)				TOTAL VALUE OF EXPIRED STOCK		0
WESTERN REGION/FAC2/DOMPIM HEALTH POST												
Condom DISP	0	0		0 0%	0		0 0%	0	0	0	0	0
Depo-Provera BP LIQ	0	0		0 0%	0		0 0%	0	0	0	0	0
Lo-Femenal BP PIL 28 PILS	0	0		0 0%	0		0 0%	0	0	0	0	0
Number of Items in Stock	0/3		AVG VARIATION ***** % (abs)		AVG VARIATION ***** % (abs)					TOTAL VALUE OF EXPIRED STOCK		0
WESTERN REGION/RHOS/EFFIA NKWANTIA HOSPITAL												
Condom DISP	12 000	12 000	06/17/93	0 0%	12 400	06/16/93	3 2%	31 800	0	2 650	5	0
Depo Provera BP LIQ	480	480	06/11/93	0 0%	500	06/02/93	4 0%	730	0	61	8	0
Lo-Femenal BP PIL 28 PILS	1 500	1 500	06/07/93	0 0%	1 700	05/17/93	11 8%	2 800	0	233	6	0
Number of Items in Stock	3/3		AVG VARIATION	0 0% (abs)	AVG VARIATION	4 2% (abs)				TOTAL VALUE OF EXPIRED STOCK		0

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GHANA/REGIONAL SURVEY

HEALTH FACILITY STOCK ANALYSIS - CONTRACEPTIVES

DESCRIPTION	ACTUAL COUNT	TALLY CARD	LAST	% VAR	LEDGER	LAST	% VAR	#DAYS		STOCK	QUANTITY	VALUE OF	
			TALLY	TALLY		LEDGER	LEDGER	LAST 12 MT	STOCK	AVG/MONTH	LEVEL	EXPIRED	EXPIRED
			ENTRY	/ACTUAL		ENTRY	/ACTUAL	CONSUMP	OUT	CONSUMPT	(MON)	IN STOCK	STOCK
Average Number of Items in Stock For all Facilities	2											TOTAL VALUE	30 000
												EXPIRED	

GHANA/REGIONAL SURVEY

REGIONAL MEDICAL STORES STOCK ANALYSIS - CONTRACEPTIVES

DESCRIPTION	ACTUAL COUNT	TALLY CARD	LAST	% VAR	LEDGER	LAST	% VAR	#DAYS STOCK	AVG/MONTH CONSUMPT	STOCK LEVEL (MON)	QUANTITY IN STOCK	VALUE OF EXPIRED STOCK
			TALLY ENTRY	TALLY /ACTUAL		LEDGER ENTRY	LEDGER /ACTUAL					
BRONG AHAFO REGION/RMST/RMS KINTAMPO												
Condom DISP	28 200	28 200	06/24/93	0 0%	0	100 0%	320 000	0	26 667	1	28 200	70 500
Depo-Provera BP LIQ	16 000	16 000	06/02/93	0 0%	0	100 0%	22 500	0	1 875	9	0	0
Lo-Femenal BP PIL 28 PILS	84 600	84 600	06/15/93	0 0%	0	100 0%	105 000	0	8 750	10	0	0
Number of Items in Stock	3/3		AVG VARIATION	0 0% (abs)		AVG VARIATION **** % (abs)					TOTAL VALUE OF EXPIRED STOCK	70 500
NORTHERN REGION/RMST/REGIONAL MED STORE TAMALE												
Condom DISP	3	0		100 0%	0	100 0%	0	0	0	***	0	0
Depo-Provera BP LIQ	2 200	2 200	05/18/93	0 0%	2 200	05/18/93	0 0%	0	0	***	0	0
Lo-Femenal BP PIL 28 PILS	9	0		100 0%	0	100 0%	0	0	0	***	0	0
Number of Items in Stock	3/3		AVG VARIATION	0 5% (abs)		AVG VARIATION 0 5% (abs)					TOTAL VALUE OF EXPIRED STOCK	0
VOLTA REGION/RMST/REGIONAL MEDICAL STORES												
Condom DISP	55 000	55 000	12/03/92	0 0%	55 000	12/03/92	0 0%	63 800	0	5 317	10	0
Depo-Provera BP LIQ	2 950	2 950	12/09/92	0 0%	2 950	12/09/92	0 0%	9 605	0	800	4	0
Lo-Femenal BP PIL 28 PILS	64 000	64 000	12/09/92	0 0%	64 000	12/09/92	0 0%	23 100	0	1 925	33	0
Number of Items in Stock	3/3		AVG VARIATION	0 0% (abs)		AVG VARIATION 0 0% (abs)					TOTAL VALUE OF EXPIRED STOCK	0
WESTERN REGION/RMST/Regional medical store												
Condom DISP	207 800	207 800	06/02/93	0 0%	207 800	06/02/93	0 0%	192 000	0	16 000	13	0
Depo-Provera BP LIQ	11 000	11 000	06/02/93	0 0%	11 000	06/02/93	0 0%	3 400	0	283	39	7 800
Lo-Femenal BP PIL 28 PILS	13 600	13 600	05/28/93	0 0%	13 600	05/28/93	0 0%	446 000	0	37 167	0	0
Number of Items in Stock	3/3		AVG VARIATION	0 0% (abs)		AVG VARIATION 0 0% (abs)					TOTAL VALUE OF EXPIRED STOCK	0
Average Number of Items in Stock	3										TOTAL VALUE EXPIRED	70 500
For all Facilities												

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*** Tally Card System Not Used

*** No Consumption Data Available

Regional Medical Stores Findings

The average inventory variation between stock records and actual count was less than 0.5% in all regional medical stores, with a range of 0 to 0.5%. None of the RMS reported being out of stock of any of the three items during the past 12 months.

Northern RMS showed no consumption in the past year (and thus had an infinite stock level) for Depo-Provera, which is the only one of the three tracer items stocked at the RMS. At the other four RMS, the average stock level was 13.2 months for all RMS, but there were some significant variations:

- Brong-Ahafo RMS had only 1 month in stock at average consumption
- Volta RMS had 33 months' worth of Lo-Femenal, and 4 months of Depo-Provera
- Western RMS had 39 months' worth of Depo-Provera, but less than one month's stock of Lo-Femenal

Two instances of expired stock were found, Brong Ahafo RMS had 28,200 expired condoms (about one month's supply), and Western RMS had 7,800 expired vials of Depo-Provera (more than two year's supply).

Health Facility Findings

Only three of the health facilities used both a ledger and tally cards to keep track of contraceptives, the rest used one or the other. The average inventory variations between tally cards and actual stock was 21%, and it was 32% between ledgers and actual stock. In one facility in the Western region (Nsuaem Health Center or Facility 1) there was a significant difference between ledger and tally cards, but in the other two facilities using both records the systems were equally accurate. Only five of the facilities showed large variations between stock and actual count. These were Nsuaem H C, Goaso District Hospital in Brong-Ahafo, Kukuom H C (Brong Ahafo), Ridge Hospital (Greater Accra), and Anyako H C (Volta). In each of these cases the stock count was lower than the recorded number for all three drugs.

On average the twenty facilities had 2 of the three items in stock, however, eight had none of the three drugs in stock. This may only mean that the contraceptives are kept in a storage area different from drugs (as is the case in most facilities) and the data collectors did not visit the contraceptive storage area.

Three of the facilities which did report stock levels of contraceptives had been out of stock for a month or more of at least one item, the longest period out of stock was 48 days.

The average stock level for all facilities was 1.8 months' worth of stock, none of the facilities had more than 11 months' stock of any item. Goaso District Hospital (Brong Ahafo), Sunyani Hospital (Brong Ahafo), Tarkwa Hospital (Northern), and Nsuaem H C (Western) were out of stock or low (less than 1 month) for one or more of the three items.

Only one facility had expired stock. Tema Urban Health Center (Greater Accra) had 12,000 expired condoms.

Transport Problems

Our regional survey responses confirmed everyone's impression that transport shortages are a major problem in both the family planning distribution system and the larger system. Our surveyors found that in general the drug supply staff would be willing to share transport if approached and if there was room (which would be most cases, we suspect)

Some of the problems preventing effective collaboration are

- 1 Lack of proximity, family planning supplies are managed from regional administrations, while Regional Medical Stores are not always located nearby, in the case of Brong Ahafo it is many kilometers. Staff from the two programs rarely meet
- 2 Lack of communication, due again to the distances, compounded by lack of reliable telephone services, which make it difficult to check with another program to see if transport is needed, even if the drug supply staff were so inclined
- 3 The need for more team-building. Hopefully the re-structuring process and decentralization will be used to promote an attitude of teamwork among the various vertical programs. This cannot however, be expected to necessarily occur in the case of the family planning program and drugs

As USAID-Ghana is no doubt aware, ODA has recently completed a study of transport constraints and requirements, we have not seen the report, but the findings reportedly indicate that in most regions and districts there are plenty of vehicles, but a chronic problem with funding for fuel, travel and out of station allowances

Revenue from Contraceptive Sales

Don Dickerson, Chief of Party in the Family Planning and Health Project, described the model for contraceptive sales through the Ministry of Health

- Contraceptives are donated to the Ministry for re-sale
- No standard percentage markup is in force, this is left to the health facility
- A percentage of funds realized is put in a separate account in Accra, the percentage is supposed to increase yearly on a sliding scale
- The funds in the separate account are to be used for purchasing contraceptives which are not available through donations

It is unclear how closely the Ministry is able to monitor this process, but they will reportedly be using the funds to purchase a contraceptive foam which is not provided by donations. We were told that CMS routinely sells contraceptives to individuals from Accra, the assumption is that they are being resold, and Mr Dickerson has noted MoH condoms on sale in drug stores, competing with the Social Marketing Program product

The data from the Regional Survey shows prices now being charged at some RMS and health facilities in the five regions. The database reports from SURVEY are found on the following four pages, unfortunately we did not get a complete set of data. Only one of five RMS and twelve of twenty facilities provided data, and in some cases no cost prices were shown, which limits the ability to calculate average markups. Still, interesting results were obtained.

GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS - CONTRACEPTIVES		CURRENT FACILITY	OFFICIAL MOH PRICE LIST (92)	LAST PRICE FROM RMS	DATE	LAST PRICE FROM PRIVSEC	MARKUP ON LATEST PRICE (P SECTOR OR RMS)	PRIVSEC PRICE AS A % OF RMS PRICE
DESCRIPTION	SELLING PRICE							
BRONG AHAFO		DHOS GOASO HOSPITAL						
Condom DISP	5 00	0 00	2 50	06/09/93	0 00		100 00%	
Depo-Provera BP LIQ	150 00	0 00	40 00	06/09/93	0 00		275 00%	
Lo-Femenal BP PIL 28 PILS	30 00	0 00	15 00	04/01/93	0 00		100 00%	
							AVG	158 33%
BRONG AHAFO ASUNAFO		FAC2 KUKUOM HEALTH CENTER						
Condom DISP	2 50	0 00	2 50	06/02/93	0 00		0 00%	
Depo-Provera BP LIQ	50 00	0 00	40 00	06/02/93	0 00		25 00%	
Lo Femenal BP PIL 28 PILS	15 00	0 00	40 00	06/02/93	0 00		-62 50%	
							AVG	-6 25%
BRONG AHAFO SUNYANI		RHOS SUNYANI HOSPITAL						
Condom DISP	2 50	0 00	2 50	05/12/93	0 00		0 00%	
Depo-Provera BP LIQ	40 00	0 00	40 00	04/21/93	0 00		0 00%	
Lo Femenal BP PIL 28 PILS	15 00	0 00	15 00	04/21/93	0 00		0 00%	
							AVG	0 00%
GREATER ACCRA		FAC1 TEMA URBAN HEALTH						
Condom DISP	2 50	0 00	2 50	09/30/93	0 00		0 00%	
Depo-Provera BP LIQ	40 00	0 00	30 00	03/30/92	0 00		33 33%	
Lo Femenal BP PIL 28 PILS	15 00	0 00	10 00	03/30/93	0 00		50 00%	
							AVG	6 94%
GREATER ACCRA		RHOS RIDGE HOSPITAL						
Condom DISP	30 00	0 00	0 00	05/01/93	0 00		0 00%	
Depo-Provera BP LIQ	30 00	0 00	0 00	04/01/93	0 00		0 00%	

GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS - CONTRACEPTIVES		CURRENT FACILITY SELLING PRICE	OFFICIAL MOH PRICE LIST (92)	LAST PRICE FROM RMS	DATE	LAST PRICE FROM PRIVSEC	MARKUP ON LATEST PRICE (P SECTOR OR RMS)	PRIVSEC PRICE AS A % OF RMS PRICE
	Lo Femenal BP PIL 28 PILS	15 00	0 00	0 00	06/01/93	0 00	0 00%	
							AVG ***** **%	
NORTHERN	WEST DAGOMBA	FAC2 MOLE HEALTH CENTRE						
	Depo Provera BP LIQ	40 00	0 00	0 00		0 00	0 00%	
							AVG ***** **%	
VOLTA	KETA	FAC1 ANLOGA HEALTH CENTRE						
	Condom DISP	2 50	0 00	2 50	01/05/93	0 00	0 00%	
	Depo-Provera BP LIQ	40 00	0 00	40 00	01/05/93	0 00	0 00%	
	Lo-Femenal BP PIL 28 PILS	15 00	0 00	15 00	01/05/93	0 00	0 00%	
							AVG	0 00%
VOLTA	KETA	FAC2 ANYAKO HEALTH CENTRE						
	Condom DISP	2 50	0 00	2 50	01/06/93	0 00	0 00%	
	Depo Provera BP LIQ	40 00	0 00	40 00	01/06/93	0 00	0 00%	
	Lo-Femenal BP PIL 28 PILS	15 00	0 00	15 00	01/06/93	0 00	0 00%	
							AVG	0 00%
WESTERN	WASSA WEST	DHOS TARKWA HOSPITAL						
	Condom DISP	25 00	0 00	0 00	04/22/93	0 00	0 00%	
	Depo Provera BP LIQ	40 00	0 00	0 00	02/04/93	0 00	0 00%	
	Lo-Femenal BP PIL 28 PILS	15 00	0 00	0 00	02/04/92	0 00	0 00%	
							AVG	0 00%
WESTERN	WASSA WEST	FAC1 NSUAEM						
	Condom DISP	25 00	0 00	0 00	01/12/93	0 00	0 00%	
	Depo-Provera BP LIQ	40 00	0 00	0 00	04/01/93	0 00	0 00%	

GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS - CONTRACEPTIVES

DESCRIPTION	CURRENT FACILITY SELLING PRICE	OFFICIAL MOH PRICE LIST (92)	LAST PRICE FROM RMS	DATE	LAST PRICE FROM PRIVSEC	MARKUP ON LATEST PRICE (P SECTOR OR RMS)		PRIVSEC PRICE AS A % OF RMS PRICE
Lo Femenal BP PIL 28 PILS	15 00	0 00	0 00	04/06/92	0 00		0 00%	
								AVG ***** **%
WESTERN WASSA WEST	FAC2 DOMPIM HEALTH POST							
Condom DISP	0 00	0 00	0 00		0 00		0 00%	
Depo Provera BP LIQ	0 00	0 00	0 00		0 00		0 00%	
Lo-Femenal BP PIL 28 PILS	0 00	0 00	0 00		0 00		0 00%	
								AVG ***** **%
WESTERN SHAMA-AHANTA	RHOS EFFIA-NKWANTA HOSPITAL							
Condom DISP	2 10	0 00	0 00	06/02/93	0 00		0 00%	
Depo Provera BP LIQ	40 00	0 00	0 00	06/02/93	0 00		0 00%	
Lo Femenal BP PIL 28 PILS	15 00	0 00	0 00	04/05/93	0 00		0 00%	
								AVG ***** **%

GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS/SUMMARY BY REGION - CONTRACEPTIVES

BRONG AHAFO REGION	CURRENT FACILITY	OFFICIAL MOH PRICE LIST (92)	LAST PRICE FROM RMS	DATE	LAST PRICE FROM PRIVSEC	MARKUP ON LATEST PRICE (P SECTOR VS RMS)	PRIVSEC PRICE AS A % OF RMS PRICE
Condom DISP	RHOS	2 50	0 00	2 50	05/12/93	0 00	0 00%
	DHOS	5 00	0 00	2 50	06/09/93	0 00	100 00%
	FAC2	2 50	0 00	2 50	06/02/93	0 00	0 00%
						AVG MARKUP	33 33%
Depo-Provera BP LIQ	RHOS	40 00	0 00	40 00	04/21/93	0 00	0 00%
	DHOS	150 00	0 00	40 00	06/09/93	0 00	275 00%
	FAC2	50 00	0 00	40 00	06/02/93	0 00	25 00%
						AVG MARKUP	100 00%
Lo-Femenal BP PIL 28 PILS	RHOS	15 00	0 00	15 00	04/21/93	0 00	0 00%
	DHOS	30 00	0 00	15 00	04/01/93	0 00	100 00%
	FAC2	15 00	0 00	40 00	06/02/93	0 00	-62 50%
						AVG MARKUP	12 50%
						OVERALL AVG MARKUP	48 61%
							0 00%

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GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS/SUMMARY BY REGION - CONTRACEPTIVES

GREATER ACCRA REGION		CURRENT FACILITY	OFFICIAL MOH PRICE	LAST PRICE FROM RMS	LAST PRICE DATE	MARKUP ON LATEST PRICE (P SECTOR VS RMS)	PRIVSEC PRICE AS A % OF RMS PRICE
DESCRIPTION	FACILITY	SELLING PRICE	LIST (92)	FROM RMS	DATE	DATE	
Condom DISP	RHOS	30 00	0 00	0 00	05/01/93	0 00	0 00%
	FAC1	2 50	0 00	2 50	09/30/93	0 00	0 00%
						AVG MARKUP	0 00%
Depo-Provera BP LIQ	RHOS	30 00	0 00	0 00	04/01/93	0 00	0 00%
	FAC1	40 00	0 00	30 00	03/30/92	0 00	33 33%
						AVG MARKUP	33 33%
Lo-Femenal BP PIL 28 PILS	RHOS	15 00	0 00	0 00	06/01/93	0 00	0 00%
	FAC1	15 00	0 00	10 00	03/30/93	0 00	50 00%
						AVG MARKUP	50 00%
						OVERALL AVG MARKUP	27 78%
							0 00%

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GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS/SUMMARY BY REGION - CONTRACEPTIVES

NORTHERN REGION	CURRENT		OFFICIAL MOH PRICE LIST (92)	LAST PRICE FROM RMS DATE	LAST PRICE FROM PRIVSEC DATE	MARKUP ON		PRIVSEC PRICE AS A % OF RMS PRICE	
	FACILITY	SELLING PRICE				LATEST PRICE (P SECTOR VS RMS)			
DESCRIPTION	FACILITY	PRICE	LIST (92)	FROM RMS	DATE	PRIVSEC	DATE	VS RMS)	RMS PRICE
Depo-Provera BP LIQ	FAC2	40 00	0 00	0 00		0 00		0 00%	0 00%
								AVG MARKUP ***** **%	
								OVERALL AVG MARKUP	0 00% 0 00%

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GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS/SUMMARY BY REGION - CONTRACEPTIVES

VOLTA REGION	FACILITY	CURRENT	OFFICIAL	LAST PRICE		MARKUP ON		PRIVSEC	
		SELLING	MOH PRICE	FROM	DATE	LATEST PRICE	(P SECTOR	AS A % OF	
DESCRIPTION	FACILITY	PRICE	LIST (92)	FROM RMS	DATE	PRIVSEC	DATE	VS RMS)	RMS PRICE
Condom DISP	FAC1	2 50	0 00	2 50	01/05/93	0 00		0 00%	0 00%
	FAC2	2 50	0 00	2 50	01/06/93	0 00		0 00%	0 00%
							AVG MARKUP	0 00%	
Depo-Provera BP LIQ	FAC1	40 00	0 00	40 00	01/05/93	0 00		0 00%	0 00%
	FAC2	40 00	0 00	40 00	01/06/93	0 00		0 00%	0 00%
							AVG MARKUP	0 00%	
Lo Femenal BP PIL 28 PILS	FAC1	15 00	0 00	15 00	01/05/93	0 00		0 00%	0 00%
	FAC2	15 00	0 00	15 00	01/06/93	0 00		0 00%	0 00%
							AVG MARKUP	0 00%	
							OVERALL AVG MARKUP	0 00%	0 00%

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GHANA/REGIONAL SURVEY

HEALTH FACILITY PRICE ANALYSIS/SUMMARY BY REGION - CONTRACEPTIVES

WESTERN REGION	CURRENT FACILITY	OFFICIAL MOH PRICE LIST (92)	LAST PRICE FROM RMS	LAST PRICE FROM PRIVSEC	DATE	MARKUP ON LATEST PRICE (P SECTOR)		PRIVSEC PRICE AS A % OF RMS PRICE
						VS	RMS	
DESCRIPTION	FACILITY	PRICE	FROM RMS	FROM PRIVSEC	DATE	VS	RMS	RMS PRICE
Condom DISP	RHOS	2 10	0 00	0 00	06/02/93	0 00	0 00%	0 00%
	DHOS	25 00	0 00	0 00	04/22/93	0 00	0 00%	0 00%
	FAC1	25 00	0 00	0 00	01/12/93	0 00	0 00%	0 00%
	FAC2	0 00	0 00	0 00		0 00	0 00%	0 00%
						AVG MARKUP	*****	***%
Depo-Provera BP LIQ	RHOS	40 00	0 00	0 00	06/02/93	0 00	0 00%	0 00%
	DHOS	40 00	0 00	0 00	02/04/93	0 00	0 00%	0 00%
	FAC1	40 00	0 00	0 00	04/01/93	0 00	0 00%	0 00%
	FAC2	0 00	0 00	0 00		0 00	0 00%	0 00%
						AVG MARKUP	*****	***%
Lo-Femenal BP PIL 28 PILS	RHOS	15 00	0 00	0 00	04/05/93	0 00	0 00%	0 00%
	DHOS	15 00	0 00	0 00	02/04/92	0 00	0 00%	0 00%
	FAC1	15 00	0 00	0 00	04/06/92	0 00	0 00%	0 00%
	FAC2	0 00	0 00	0 00		0 00	0 00%	0 00%
						AVG MARKUP	*****	***%
						OVERALL AVG MARKUP	*****	***%
								0 00%

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RMS Data

As noted, only one regional medical store provided data on the selling price of contraceptives to health facilities, Brong Ahafo sells all three of the items at the CMS price, with no markup, as they do for all drugs

Health Facility Data

Twelve facilities reported contraceptive sales, not all showed cost data, but markups could be calculated for six facilities

- Goaso District Hospital (Brong Ahafo) marked condoms and Lo-Femenal up by 100%, and added a markup of 275% to Depo-Provera
- Kukuom H C (Brong Ahafo) lost 63% on Lo-Femenal, marked Depo-Provera up by 25%, and sold condoms at cost
- Sunyani Hospital (Brong Ahafo) sold all three items at cost
- Tema Urban H C (Greater Accra) marked Depo-Provera up by 33%, Lo Femenal by 50%, and sold condoms at cost
- Anloga H C and Anyako H C (Volta) sold the three items at cost

Presumably the prices resulting from the markups are at least competitive with local private sector prices, although we have no data on this

Feasibility of Integrating Family Planning Commodities into MoH Logistics

Ms Assan was out of the country, so we were unable to meet with her to obtain her views on the functionality of the contraceptive distribution system and the feasibility of integrating contraceptives into overall CMS logistics. We did meet with Mr Quist-Therson at the Social Sector Policy Unit and Mr G H Attu, Acting Executive Director of the Ghana National Family Planning Project. Apparently under re-organization, the National Population Council Secretariat will be responsible for coordinating population activities. Both of these officials cited access to transport as the major problem plaguing the contraceptive distribution system. Mr Attu would support eventual integration of the distribution systems, but is not in favor of integrating all service delivery into the MoH system. We discussed the feasibility of using private contractors to transport contraceptives, but Mr Attu was skeptical that they would deliver on bad roads during rainy periods.

We discussed the issue of integration with senior Ministry of Health officials, who gave the frank opinion that if contraceptives were integrated, they would not likely enjoy any sort of preferential treatment, and would likely fall to near the bottom of the priority list in Regional Medical Stores and health facilities. This opinion was seconded by discussions with Cash and Carry Coordinators.

Tim Rosche of the Family Planning Logistics Management Project said that he believes that integration is a noble goal, but premature. Don Dickerson, Director of the Ghana Family Planning and Health Project, expressed his reservations on the near-term feasibility during the earlier visit to Ghana.

It should be remembered that the distribution of drugs through the MoH logistics system is not working particularly well at this time. There is likely to be some sort of change in the system once the follow-up "privatization" study is done, and integration may become feasible in the future.

Recommendations for Contraceptive Procurement and Distribution

1 Feasibility of integration of contraceptives into the MoH system

Based on our information, we suggest it would be best to maintain a separate system of contraceptive procurement and logistics for the foreseeable future. The MoH logistics system is still not functioning as intended, and family planning supplies would not receive priority attention if they were integrated into the MoH system.

2 Consider options for team-building

It would be easier to facilitate transport sharing between family planning and drug supply staff if the staffs of both programs viewed themselves as part of the same team. One team-building approach might be to provide some funding support to districts for fuel, and possibly for allowances, with the condition precedent that it be used to support joint trips to RMS and/or CMS. Another option might be to plan joint training in supply management or needs-forecasting and quantification. Another option might be a joint training of trainers for Regional Cash and Carry Coordinators and selected MCH staff, this sort of workshop normally focusses on team-building.

3 Assistance in planning and evaluation

One of the more pressing needs in the contraceptive distribution system may be replacing UNFPA advisor Bruce Campbell at CMS, who has apparently been responsible for coordinating central contraceptive MIS activities. We would recommend that the USAID Mission provide support if necessary to replace Mr Campbell. This was also recommended by Mr Rosche of FPLM.

It is suggested that computer capability should be provided to the MoH MCH/Family Planning Division so that spreadsheets can be used to produce more accurate quarterly needs assessment reports.

2.3 Drug Policy, Legislation and Regulation

National Drug Policy

There is no official National Drug Policy backed by legislation. As part of the actions towards the development of an essential drugs list and a national formulary in 1988, a draft policy was prepared to guide the MoH. Efforts were made by the National Drugs Committee to further develop the policy document. This action is presently dormant due mostly to the inactivity of the National Drugs Committee.

The issues covered by the draft National Drug Policy were

- drug control and administration
- drug legislation and licensing
- regulation of prescribing and dispensing at various health care levels
- selection of drugs and pharmaceutical products
- the essential drugs concept
- use of generic name for procurement and prescribing
- traditional medicine
- local production of pharmaceutical products
- quality assurance of drug substances and products
- inclusion of concepts of rational drug use in the training of health professionals
- national formulary and treatment guidelines for various levels of health care

Drug Control Legislation

Legislation concerning drug control was enacted in 1961 (*Pharmacy and Drugs Act, 1961 Act 64*). This act has not been revised since. However several amendments and regulations have been added. The last regulation was made in 1990 and it concerned penalties for infringement of sections of the act. The implementing authority of Act 64 is the Pharmacy Board.

The current drug control legislation (Act 64) addresses the control of the importation, exportation, storage, distribution, supply and sale of drugs. The control of drug manufacture is not extensively dealt with in the act. Other issues relating to drug registration, labelling, information and advertisement, drug categorization for sale and dispensing purposes, and conditions for the sale of drugs (prescription and non-prescription drugs) are well covered in the act.

A new act has been passed (Food and Drugs law, December 1992) but is yet to be published and made official. The law would establish an agency similar in concept to the USFDA, with two branches, one dealing with drugs and the other with food. The legislative document addresses all of the relevant areas, and will be a step forward in most respects when it is put into effect. However, even if the law is made official, more extensive work is required to develop implementing regulations.

Pharmacy Practice Act

The practice of pharmacy is also governed by the Pharmacy and Drugs Act (Act 64) and administered by the Pharmacy Board. A new law to control the pharmacy profession (the Pharmacy Council law) is presently under consideration.

The Pharmacy and Drugs Act of 1961 empowers the Pharmacy Board to license pharmacists, license premises for pharmacy business, retail and wholesale, and to take disciplinary action against pharmacists for infringement of the act. The last time disciplinary action was taken for infringement of the law was a month ago (for professional misconduct). The law also addresses the efficacy and wholesomeness of drugs.

The act is mute on drug prescribing or sales without a prescription (except for first aid), and on generic substitution. In practice, a great deal of direct sales to the public of prescription medications occurs, and generic substitution is common practice. Although the act makes provision for price control under section 19 this is not currently enforced.

The act allows only pharmacists to dispense drugs. Dispensing assistants do so under supervision. Doctors are allowed to dispense drugs in an emergency or if there is no pharmacy shop within five miles of their clinic or hospital. Chemical sellers are licensed to dispense specific drugs. In practice, midwives and doctors dispense drugs from their premises irrespective of the proximity of a pharmacy shop.

Medical Practice Act

The practice of medicine is controlled by the Medical and Dental Decree, 1972 (*NRCD 91*). The Decree deals with issues concerning the licensing of medical practitioners, medical training and disciplinary actions for professional misconduct. The implementing agency of this decree is the Medical and Dental Council. The decree defers actions relating to drug prescribing, dispensing and importation to the Pharmacy Board under Act 64.

The decree is silent on medical fees. The inspection and licensing of premises for medical practice is the responsibility of the Private Hospitals and Maternity Homes Board.

The Decree allows individuals not registered as medical or dental practitioners to do the following things related to medical practice:

- the application of dressings
- the practice of an indigenous system of therapeutics by any person who is an indigenous inhabitant of Ghana, does not perform any act dangerous to life and does not supply, administer or prescribe any restricted drug
- injection - intradermal, subcutaneous, intramuscular and intravenous - of drugs under the authority of the Director-General of Health Services (Director of Medical Services)

The prescribing of drugs is limited to doctors, medical assistants and midwives.

Application of Policies, Legislation and Regulations

Doctors and pharmacists require a license to practice and the license is renewable annually. Pharmacy shops are required to have a supervising registered pharmacist on the premises. Chemical Sellers and Pharmacies must renew their license annually. In accordance with the current laws and regulations, pharmacists are required to keep records of all prescriptions dispensed, all issues and receipts and a separate record for controlled substances. Physicians in private practice are also expected to keep records of patients' treatment and use of controlled substances.

All pharmaceutical products on the market are required to be registered. All registered products have a unique registration number. Pharmaceutical products from different sources are individually registered. The Pharmacy Board requires that applications for the registration of a pharmaceutical product be accompanied by the following documents:

- Certificate of free sale from country of origin
- Evidence of registration in other countries
- Certificate of analysis
- Clinical trial reports
- Methods of analysis
- Documentation of pharmacology, toxicology, and pharmacokinetics

A certificate of Good Manufacturing Practice (GMP) from the competent authority in the country of origin is also required as part of the documentation. Six copies of the completed application form, along with supporting documentation, are submitted with a registration fee of approximately US\$50.00 for a new drug product or approximately US\$30.00 for a generic product application.

Drugs must be re-registered every five years. The total number of registered pharmaceutical products is made up of 1574 specialties (this means, for example, that Seprin and Bactrim are counted separately). Drug registration started in 1961, however, the re-registration exercise was introduced in 1991. There is no information as to whether unregistered drug products may be on the private sector market, it is known that drugs are smuggled in from neighboring countries, and that some of these products are on the private market.

Currently the "product" is approved and not the specific indications for use of the drug substance. Therefore, there is no such thing as an "approved indication" in Ghana. A revised application form to be implemented in the future requires the manufacturer to apply for indications for use of products submitted for registration.

Presently a manual management information system (MIS) is being used to manage drug registration. The Pharmacy Board has two desk top computers and intend to dedicate one of them to a computerized MIS. This change over is anticipated to occur soon, although there are no firm plans as yet, and no software has been selected. There are trainable individuals on the staff at the Board, but limited experience with computers exists. A CMS pharmacist, Mr. Annan, (who has computer training and interest) is expected to help in automating the drug registration system.

Importation of drugs into the country is governed by regulations stated in the Pharmacy and Drugs Act of 1961. In addition to pharmacists, doctors and dentists, veterinary surgeons and pharmaceutical companies can import drugs. The official bodies involved in drug importation are the Pharmacy Board, Ministry of Health and the Customs, Excise and Preventive Service (CEPS).

The importer presents a request to the MoH for a permit to import. The request is forwarded to the Pharmacy Board for review to ensure that the products to be imported are registered. The results of the review are sent back to the MoH and the permit is issued. CEPS will only clear the drugs from the ports on presentation of the MoH permit. Drugs imported by the MoH are subjected to duty just like those of the private sector. Duties on pharmaceutical products are determined by the CEPS and the Ministry of Finance. Apart from drugs imported for specific vertical programs like Family Planning and EPI, all drug imports are subjected to duty. Duties on drugs were last revised in 1989.

The Pharmacy Board is responsible for the enforcement of regulations of pharmacy practice, chemical sellers, drug advertisement and marketing. The Pharmacy Board is jointly responsible with the Ghana Standards Board for the enforcement of regulations on drug manufacture and drug product quality. Drug importation regulations are enforced by the MoH, Pharmacy Board and CEPS. The Medical and Dental Council is responsible for medical practice while the MoH and the Nurses and Midwives Council are responsible for traditional birth attendants and midwives respectively.

Recommendations for Drug Policy Legislation and Regulation

1 National drug policy and Food and Drug law

The MoH would benefit from a clearly formulated National Drug Policy to direct activities in the pharmaceutical sector. The National Drug Policy should be formalized and procedures for the revision of the essential drugs list developed. The Food and Drug law was passed in December 1992, but has not yet been published, the act is complete, but implementing regulations will still need to be developed. It is suggested that the Ministry consider obtaining external assistance to facilitate the process of developing regulations, once the new law comes into effect.

2 Drug registration computerization

The Ministry of Health should make arrangements to install drug registration software at the Pharmacy Board. The WHO Drug Management and Policy Division, working with the Pan American Health Organization MIS Division, has developed drug registration software which may meet Ghana's needs with some adaptation and modification. WHO and PAHO do not now have staff and funding to install their software in Ghana, but Ghana could obtain a copy of the software for evaluation and use on request. We have provided a suggested work sequence for computerizing registration in Section 1.6.

3 Access to drug information at the Pharmacy Board

Access to current drug information is needed to assure that product registration applications are properly reviewed by the Pharmacy Board. Given the recurrent expense of maintaining a library of medical journals and texts, it is suggested that once a drug registration system is installed, an electronic database of drug information should be made available on the computer system. This could be done either through CD-ROM technology, or by hook-up to an international service providing access to medical/drug information databases by modem. The CD-ROM option would probably be more cost-effective.

The information system should also be used to consider which indications should be approved when a drug is registered in Ghana.

4 Information on registered products for physicians and pharmacists

Although the Pharmacy Board has approved a new drug registration application form that requires the manufacturer to specify which indications are being applied for, this is yet to be effected. When a product is approved no formal Pharmacy Board announcement is made. This leaves it to the product's manufacturer to let prescribers and dispensers know of new product approval. Unless the Pharmacy Board has very effective marketplace and product monitoring, the potential for the marketing of products for unproven uses would seem to be relatively high.

The Pharmacy Board should implement the revised drug registration application, and should develop and implement a system for informing Ghanaian physicians and pharmacists about new product approval and new product information. Venues for providing this information might include regular professional meetings or through regular cooperative announcements in widely distributed professional journals (eg *Ghana Medical Journal*, *Ghana Pharmaceutical Journal* and the *Health Courier*).

5 Drug registration fees

The Ministry of Health should consider raising the drug registration fees, and using the revenue to support monitoring, enforcement and quality assurance activities of the Pharmacy Board. It seems probable that the current fees of US\$50 for new drugs and US\$30 for generic drugs could be increased at least ten-fold (to the neighborhood of US\$500 per registered product) with minimal adverse effect, other than complaints from manufacturers and importers.

However, some research would be required to determine the optimum fee, which should maximize revenue (and be comparable to practices in other countries), while minimizing adverse effects on local industry and avoiding a situation where necessary products are kept out of or removed from the Ghana market because of the fee. It is possible that a two-tiered fee system could be implemented, whereby imported drugs have a higher registration fee than those which are locally manufactured, again, this should be balanced against the possibility of excluding vital drugs from the market.

2.4 Formulary/Essential Drugs List

The current edition of the Ghana Essential Drugs List and National Formulary, was first published in 1988 and applies only to public sector health institutions. Prior to 1988, a National Formulary had been published in 1976. A revision of the book was done in 1991, but the proposed draft document has not yet been printed for distribution. In the regional survey, less than half (45%) of the health facilities visited had a copy of the 1988 manual.

The lack of availability of the 1988 edition, and the delay in publication of the 1991 edition of the manual, has three important negative consequences:

- Prescribers do not have access to the list of essential drugs and the therapeutic guidelines and drug information the manual provides. This is a lost opportunity to reinforce the Essential Drugs concept, and improve both the use and availability of essential pharmaceuticals. This is particularly significant, since the printing and distribution of the first Essential Drugs List was insufficient.
- Physicians and pharmacists actively participated in the meetings during the last revision. Regardless of the outcome (acceptance of their choices and recommendations), the current situation may be perceived as a lack of commitment on the part of Ministry of Health authorities to sustain improvements in the health care system resulting in loss of credibility with prescribers.
- Members of the National Drug Committee have invested significant time and effort to produce this therapeutic tool. Failure to follow up this effort erodes the enthusiasm and willingness of committee members to participate in the formulary process. This is already reflected by the lack of committee meetings since 1991.

The National Drug Committee, composed of 11 members, was appointed on a permanent basis for updating the National Formulary and Essential Drugs List in 1988. The membership of the National Drug Committee includes the following:

- A chairman appointed by the Director of Medical Services
- The Deputy Director of Medical Services
- The Deputy Director of Pharmaceutical Services
- One representative of the Ghana Medical Association
- One representative of the Pharmaceutical Society of Ghana
- Two representatives of the University of Ghana Medical School
- One representative of the University of Science and Technology School of Medical Sciences
- One representative of the University of Science and Technology Faculty of Pharmacy
- One representative of the Ghana Registered Nurses Association
- One representative of the Ministry of Finance & Economic Planning
- The Pharmacy Board Registrar

The members of the Committee were appointed by the Director of Medical Services based on recommendations from the participating institutions.

The Formulary Committee mandate includes drug selection, drug utilization review, adverse drug reaction surveillance, and drug information and education. Although expected to meet quarterly, the National Drug Committee has not convened at all since 1991. Minutes were kept of all committee meetings, but no manual for committee procedures has been prepared.

Restrictions on prescribing and use of essential drugs were established according to level of training and level of health care facility. They are, in principle, enforced through control of drug distribution from the Central Medical Stores.

Changes in the Essential Drugs List and National Formulary are effected through a formal evaluation and approval process. Approval of inclusion or deletion of drugs requires prior assessment of the request by the National Drug Committee. The requests for therapeutic formulary changes are submitted through simple letters asking for inclusion or deletion of the drug. In the 1990/91 review exercise all requests were for inclusion of pharmaceutical products and were originated by pharmaceutical company representatives. In general, the requests included references or copies of original research articles and drug company data.

The evaluation and approval process undertaken by the National Drug Committee may include the assessment of tertiary (reference) sources, review of "review articles," and review of available original research articles. The literature review is conducted by the committee members, as there is no independent drug information service or support staff available to do this work. Although the Essential Drugs List and National Formulary was intended to be revised every two years, in practice the revision process was undertaken three years later (1991).

Data on drug utilization in the public sector were not available for consideration during the 1991 revision of the Essential Drugs List and National Formulary. During the 1991 revision process, consultations with prescribers were done through separate meetings involving physicians and pharmacists from the public and private sectors, respectively. At these meetings the relative advantages and disadvantages of the proposed changes were openly discussed. Definitive approval of changes took place in a separate National Drug Committee meeting.

There is no official procedure for obtaining non-formulary drugs, although prescribing and stocking of non-formulary drugs does occur in the public sector. Generic prescribing is recommended by norm, but is not mandatory, in the public sector health facilities. There is no specific legislation mandating or prohibiting generic substitution, and it is practiced in both the public and private sectors.

There is also no legislation regarding therapeutic substitution, but it is practiced in the private sector, for antibiotic and analgesic treatments. Examples of therapeutic substitution known to occur in the private sector include ranitidine-cimetidine, nifedipine-isradipine, chloroquine-amodiaquine, bendrofluzide-furosemide, and acetylsalicylic acid-paracetamol. Examples from the public sector included mebendazole-levamisole, amoxicillin-ampicillin, praziquantel-metrifonate, tiabendazole-mebendazole, and cotrimoxazole-amoxicillin.

The published Essential Drugs List and National Formulary classified the drugs according to the WHO classification and included information on the approved levels of use for the included therapeutic drugs, brief monographs on each individual therapeutic agent, as well as general information on the therapeutic classes. Each therapeutic drug monograph included information on indications, adult and pediatric dosages, adverse reactions, contraindications, precautions, and drug interactions. Information on the use of therapeutic drugs during pregnancy and breast feeding was also included. In the 1991 draft Essential Drugs List and National Formulary a new section on extemporaneous preparations was added. The National Formulary does not include medical supplies.

Recently, a group of private sector prescribers have expressed interest in developing their own formulary with the assistance of Dr. David Ofori-Adjei.

Recommendations for Formulary/Essential Drugs List

1 Publication of the Essential Drugs List and National Formulary

It is recommended that the MoH publish the revised 1991 Essential Drugs List and National Formulary in pocketbook size as soon as possible. The Ministry of Health should ensure that enough copies are printed to cover workers, primarily physicians and pharmacists, at all health care facilities. There should also be enough copies for medical and pharmacy students in their last year of training. The revised 1991 Essential Drugs List and National Formulary could be sold at cost, or even a small markup. Medical and pharmacy students are already purchasing their textbooks (low-cost English editions) and they would certainly welcome the opportunity to obtain a copy of this national reference for use, particularly during the clinical clerkships.

If possible, the National Drug Committee should update the 1991 information to reflect current information, where necessary. Since two years have passed since the Essential Drugs List was last revised, although not adopted or implemented, prescribers may not consider the formulary as current without another review. The 1991 revision produced only a few changes, and it is likely that few changes would be required to bring the 1991 revision to 1993 currency. If, however, revisions to the 1991 text would introduce significant delays in the publishing process, the need for another revision at this stage should be carefully assessed. Whether or not a new revision is effected, there should be a definite commitment and timetable to publish the document.

The Ministry of Health, through the National Drug Committee and other interested parties, should consider preparing an edition of the Essential Drugs List and National Formulary that is appropriate to the needs and the level of training of primary care workers such as the Medical Assistants.

2 National Drug Committee

The National Drug Committee should reconvene. Important issues of rational pharmaceutical use, particularly data generated by this assessment and recent studies and the possibility of future activities need to be addressed by the Committee.

In addition to selecting essential drugs, the National Drug Committee mandate includes the study of drug utilization, monitoring adverse drug reactions, and drug information and education. National Drug Committee efforts have thus far focussed mainly on essential pharmaceuticals selection. Rationalizing drug utilization involves addressing the other issues.

Although some studies have generated data on drug utilization, much work is still needed. On-going collaboration between the Ministry of Health's Health Research Unit and the medical and pharmacy schools in Ghana's two universities should provide valuable contributions and certainly must be sustained.

2.5 Drug Information and Drug Utilization

Patient Utilization and Morbidity

The number of public sector outpatient medical encounters for 1992 was 5,109,109. The number of hospital admissions for the same period was 361,812, made up of 142,182 males and 219,630 females. Statistics on morbidity (reasons for consultation/diagnoses) and mortality, and other health care facility activities are recorded and processed, manually and by computer, by the Centre for Health Statistics.

The compiled statistics on morbidity (reasons for consultation/diagnoses) and mortality (not provided), and other health care facility activities are usually three months old, with data normally available from the previous quarter. There is about an 84% submission rate to the Centre, on average.

TOP-TEN REPORTED CAUSES OF OUT-PATIENT MORBIDITY 1992

<u>RANK</u>	<u>DISEASES</u>	<u>N° CASES</u>
1	MALARIA	1,446,936
2	UPPER RESPIRATORY INFECTIONS	269,820
3	DIARRHOEAL DISEASES	194,820
4	DISEASES OF THE SKIN (INCL ULCERS)	165,645
5	ACCIDENTS (INCL FRACTURES, BURNS)	173,505
6	PREGNANCY-RELATED COMPLICATIONS	116,125
7	INTESTINAL WORMS	107,832
8	GYNECOLOGICAL DISORDERS	94,421
9	HYPERTENSION	74,861
10	ACUTE EYE INFECTIONS	72,585
TOTAL REPORTED CASES		3,626,083

Source: Centre for Health Statistics, Ministry of Health

Treatment Protocols and Guidelines

Therapeutic guidelines are provided in the Essential Drugs List and National Formulary (EDL/NF) published in 1988 and in the draft of the 1991 revision. The EDL/NF contains standard treatment protocols for several common diseases, such as Acute Respiratory Infections, Malaria, Sexually Transmitted Diseases (STD), Tuberculosis, Urinary Tract Infections, Heart Failure, Asthma, Shock and the use of psychotropic substances.

These treatment protocols (guidelines) were developed by the National Drugs Committee on the basis of literature review and assistance from local consultants (recognized experts from the medical and pharmacy faculties in Ghana). In principle the standard treatment protocols are aimed at medical practitioners in the health care system. The standard treatment protocols were introduced through the distribution of individual copies to doctors, pharmacists and health institutions and through workshops and seminars.

Nine out of the 20 health facilities visited in the regional survey had copies of the 1988 edition of the EDL/NF. Two of the five regions visited were using standard treatment protocols on malaria and diarrhoea. These had either been developed by national programs or were modifications of WHO documents. The documents were available at the regional hospital, the district hospitals and health centers of these regions. No region had developed its own treatment protocols. Formal efforts are not undertaken to promote compliance with the treatment protocols.

The prescribing of certain drugs is restricted to selected prescribers according to the level of training (medical specialty and training as opposed to other disciplines and professions) and according to the level of the health facility (whether district health centre, district hospital, regional hospital or teaching hospital). Anecdotal evidence suggests that compliance with the treatment protocols and prescribing restrictions is not universal. Drug therapy is not formally reviewed in the public sector health facilities. The following resources for confirming diagnosis and monitoring drug therapy are available:

	<u>Primary Care Health Center</u>	<u>District Hospital</u>	<u>Referral Hospital</u>
Clinical laboratory (blood and chemistry)	Some	YES	YES
Bacteriology laboratory (culture & sensitivity)	Some	YES	YES
Pharmacokinetics laboratory (drug blood levels)	NO	NO	NO

Drug Utilization Review

Therapeutic drug utilization statistics (consumption or prescribing data) are not compiled by the Ministry of Health.

As discussed in Section 1.2, we assessed drug use in twenty health facilities using the methodology developed by the International Network for Rational Use of Drugs and revised and published by the WHO Drug Action Programme. The results are discussed in comparison with 13 other countries in Section 1.2, and will only be summarized here.

Prescribing Practices

The higher the number of drugs prescribed per patient encounter, the higher the costs of drug therapy (and the greater the chance for adverse drug reaction or interaction). The average number of drugs prescribed per curative encounter was 4.3 in the Ghana sample, which is about twice as many drugs per encounter as found in the other countries. This suggests that over-prescribing is a problem in the public sector.

Generic prescribing is recommended in order to assure that the lowest cost generic product available can be dispensed. In the Ghana sample, 59.4% of drugs were prescribed generically, this is comparable to most of the other countries which have been surveyed.

In most patient populations, relatively few patients really need injections, and the cost and potential risk of adverse reaction is much higher with injections than with other routes of drug administration. In Ghana, 55.7% of the drugs prescribed were injections, although this could possibly be justified by morbidity patterns, this is more than twice as high a percentage of injections compared to the other countries. It is likely that injections are being overused in the sample facilities.

Antibiotics are indicated only to treat established bacterial infections or to protect against such infection in patients with compromised immunity, in many (if not most) countries antibiotics are overused, leading in some cases to the emergence of resistant bacteria and in all cases to wasted resources. In Ghana, 46.6% of cases received antibiotics, this result is slightly higher than, but comparable to, the percentage of antibiotics received in the other countries surveyed. This does not mean that an antibiotics percentage of 46.6% is good, many developing countries use too many antibiotics.

Public Sector Dispensing Practices

In some public sector pharmacies, prescriptions are filled by a pharmacy assistant with supervision by a pharmacist, while in many there is no pharmacist supervision. Pharmacists in the public sector are located mainly at regional and district hospitals. Only one of the health centers had a pharmacist.

The percentage of drugs prescribed which are actually dispensed is a good indicator of how well the drug supply system is working, when used in concert with the percentage of tracer drugs in stock. Used alone, this indicator may be misleading, because prescribers in many public facilities tend to prescribe drugs they believe are in stock. In our sample, 86% of prescribed drugs were dispensed (which means that 14% were not dispensed).

The average duration of the dispensing interaction is intended to measure the time it takes pharmacists to fill prescriptions and to provide information to patients. In Ghana, the average dispensing time was 125 seconds (slightly over two minutes). This is more time than spent in the three other countries surveyed, but it is difficult to believe that much information can be provided to the patient when the total dispensing time is two minutes.

The percentage of drugs dispensed which are properly labelled is the newest INRUD/WHO indicator, and Ghana is the first country reporting results. In the INRUD/WHO definition, proper labelling requires that each drug dispensed be labelled with at least the patient name, the drug name, and instructions for when the drug should be taken. In the Ghana sample, only 12% of the drugs dispensed were properly labelled. The most common item missing was the drug name, reportedly pharmacists are reluctant to include this because patients may be tempted to simply buy the same medication in the private sector rather than return to the health facility, if the disease (or symptoms) recur or in the case of chronic medication.

The real indicator of the effectiveness of labelling and verbal instructions provided by the prescriber and dispenser is whether or not patients understand how to take the drugs they have received. This is measured through interviews with patients who have just left the dispensing area. In the Ghana sample, 76% of patients interviewed knew how they were supposed to take their drugs. Given the relatively brief total dispensing time and the low percentage of drugs which were properly labelled, it is surprising that 76% of patients could repeat the proper instructions.

Private Sector Dispensing Practices

We did not do an INRUD-style survey of dispensing practices in the private sector, but did do a survey of antibiotic sales without a prescription, using the confederate purchase methodology. Eighty-five percent of the pharmacies visited (17 of 20) sold antibiotics without a prescription. Unfortunately this is not unusual, in the three other countries where we have done this survey, 100% of the pharmacies surveyed sold without a prescription.

This direct sale of antibiotics to the public has a much greater effect in producing the world-wide increase of bacterial resistance to the drugs than does over-prescribing by physicians, according to many authorities. The direct sale of prescription drugs in general can cause many problems related to lack of knowledge on the part of consumers, the most common problems are inappropriate therapy, sub-therapeutic dosage or treatment regimens, and adverse drug reactions and drug interactions.

The ability to effectively control direct sale of prescription medications is a primary measure of the effectiveness of a drug control policy and the agency which enforces it.

Drug Information for Health Care Practitioners

Drug information resources are located mainly in the faculties of Medicine and Pharmacy in the University of Ghana and the University of Science and Technology. This information is centrally accessible, although it is uncertain how often practitioners who are not directly attached to the Universities use the information resources.

The Pharmacy Board and the office of the Director of Medical Services also receive drug information publications from international organizations. The following drug information references are available at different locations in the public health sector (but rarely all in one place, with the exception of the Centre for Tropical Clinical Pharmacology)

- National Essential Drug List and National Formulary
- USP DI (1991, 1992, 1993)
- AMA Drug Evaluations
- Martindale
- British National Formulary
- Physicians Desk Reference (PDR)
- MIMS Africa

In both the public and private sectors, drug information developed and disseminated by drug manufacturers appears to be the resource most readily available to physicians and pharmacists. This information may take the form of package inserts that are distributed with the drug product, direct mailings, drug entries in MIMS Africa, journal advertisements and/or visits from sales representatives.

In the larger pharmacies (eg, the pharmacy department of the Korle Bu Teaching Hospital) a limited number of references are generally found. The latest editions of these references are usually not available. Relatively recent editions of Martindale and the British National Formulary (BNF) are the most common. Although manufacturer-based compilations like MIMS are often mentioned as resources, current editions are seldom available in health facilities. Also, medical journals and drug bulletins are rarely available at this level. Physicians and pharmacists often buy the above publications at their own expense for their personal libraries.

In the regional survey, the most frequently used information sources cited by physicians were MIMS (14 out of 20 facilities surveyed), the pharmacists on staff (8 out of 20), and the BNF (6 out of 20). Drug company representatives are a major source of therapeutic information, along with drug package inserts. Prescribers may also hold individual subscriptions to journals like *Medicine Digest*, and *Postgraduate Doctor*. Colleagues are also another source of therapeutic information. The sources of information for prescribers and pharmacists in the private sector are no different from those in the public sector.

Periodicals such as the *Ghana Medical Journal*, the *Ghana Pharmaceutical Journal*, and the Health Courier are received by most physicians and pharmacists in Ghana. The *Ghana Medical Journal* is published quarterly, the *Ghana Pharmaceutical Journal* comes out two or three times each year, and the *Health Courier* is published six times a year. Publication of the two professional society journals has been somewhat sporadic and/or delayed because of resource limitations. The *Health Courier* has maintained a stable publication schedule since its inception in 1991.

The MoH contributes financially to the publication of the *Ghana Medical Journal*. The *Ghana Medical Journal* is distributed to all members of the Ghana Medical Association. In a review of the last two year's issues of the *Ghana Medical Journal*, approximately 15% of the articles published dealt with drugs or drug therapy. In the same issues, there were approximately 40 drug advertisements. Most of the drug advertisements presented a brief message as to why the drug should be used, a few (7) included a message along with key information relating to use, dose, precautions, contraindications, side effects, etc. Drug advertisements for professional journals are not reviewed or approved prior to publication.

The MoH does not hold any subscription to international journals. Faculty of Medicine libraries however, hold copies of many general medical journals, including, *The Lancet*, *The New England Journal of Medicine*, *British Medical Journal* and *Tropical Doctor*. The following drug bulletins are also received by various individuals in the public health sector but are not widely distributed: "The Prescriber" (UNICEF), "WHO Drug Information" and the "Essential Drugs Monitor".

Reference texts and/or journals are usually kept in an institution's library (if there is one) or in the office of the head of the institution or unit. The use of reference texts is determined by an individual practitioner's perception of needs, use does not occur frequently.

The present financial state of the health sector makes the acquisition of reference texts a low priority. Heads of various units and departments in the MoH would usually coordinate the acquisition of these documents. In the medical faculties this would be done by the librarian.

In general, new reference texts/journals come to a departmental information coordinator's attention irregularly, through mailings and donations. These reference texts are obtained mainly through donations. Purchases are occasionally done. The annual-MoH budget for drug information reference documents and the annual MoH expenditure for drug information reference documents was not available to the assessment team.

The MoH does not inform prescribers about the relative costs of treatment. Indeed, this issue has not been addressed by the MoH adequately at the national or the regional and district levels. The Ministry of Health has no mechanism in place to inform practitioners about new drugs on the market, new drugs on the essential drugs list and therapeutic information on individual drugs or therapeutic sub-groups/classes.

Requests for drug information are rarely referred outside the health facility where the requestor practices. This may be due to a number of factors, including lack of access to communications and not knowing where to make the referral. Although no formal drug information referral center has been designated, the Centre for Tropical Clinical Pharmacology and Therapeutics has a library of drug information references that could serve as a base for such an activity.

Apart from the Essential Drugs List and National Formulary, there is no official MoH means of disseminating drug information. Drug information may be shared during seminars and workshops organized for other purposes. The University of Ghana Medical School library produces a quarterly abstract service that includes therapeutic information. This is distributed to MoH facilities. Requests for reprints of full articles are dealt with by the librarian.

The following institutions/organizations are interested in preparing/communicating drug information: The Pharmacy Board, The Centre for Tropical Clinical Pharmacology of the University of Ghana Medical School, the Faculty of Pharmacy of the University of Science and Technology.

Drug Information for Consumers

The consumer of medications must have a certain base of information/education if proper use of prescribed drugs is to be expected. This is true for both general aspects of therapy and drug-specific information.

In Ghana, the current practice is that when a drug is dispensed to a patient, basic directions for use are generally included on the package given to the patient. For purposes of the regional survey the following elements were considered to be essential for a properly-labeled prescription drug

- patient name,
- drug name and strength,
- dosage instructions, and
- date dispensed

As noted in the discussion on dispensing practices, in almost all instances, the prescriptions included in the survey did not meet these basic requirements for proper labeling, with the most frequently omitted element being the drug name and strength. In talking to a number of pharmacists, there seems to be a general reluctance to tell the patient what drug they are taking. The primary reason for this is their concern that if the patient knows the name of the drug prescribed, he or she will simply purchase it themselves without a prescription when they experience similar symptoms in the future.

Physicians, when they prescribe a drug for a patient, may provide some oral information as to the drug's proper use and precautions relating to its use. The pharmacist typically limits information transferral to the dosage the patient needs to take. Other than the information written on the prescription package, no written information describing use, precautions, or side-effects is typically provided. Basic directions for use are included on the labeling of over-the-counter products packaged by the manufacturer.

The Health Education Unit of the Ministry of Health and the Ghana Health Students Association have been providing drug information to consumers. These activities take the form of lectures, posters, newsletters, leaflets and radio messages. The health students' activities take place annually. The private sector provides therapeutic information to the consumer through television advertisements of their products. There are also privately owned newsletters and magazines that occasionally cover therapeutic topics.

These initiatives have included, among others

- family planning and proper use of oral contraceptives, condoms and foaming tablets
- proper treatment of diarrhoea with ORS
- prevention and treatment of malaria
- AIDS prevention

The Ghana Social Marketing Program has been active in helping to produce consumer information, primarily on oral rehydration and family planning.

The educational approaches used have included leaflets/brochures (including some utilizing extensive graphics, for use by individuals who may not be able to read), posters/billboards, radio and television messages, programs, and face-to-face encounters.

Written materials have in the past been primarily written in English. The current trend, however, is for leaflets and posters to be written in local languages, whenever possible. Written materials are drafted and pretested before final adoption. Resources for translating English-language drug information into local languages are available in the Health Education Unit of the MoH. It may also be contracted out to the Institute of Ghana Languages or the Non-formal Education Division of the Ministry of Education.

The use of volunteers in local communities to provide an access point for delivery of face-to-face health education messages has been extensively utilized. Called Community Development Workers, these volunteers are provided with basic training on relevant health issues. A health manual that outlines the health information messages that need to be relayed to the community serves as the primary resource.

Health education initiatives are frequently hampered by lack of funding. A number of the current initiatives have been funded by various donor organizations. Costs are dependent on the type of campaign. Leaflets and brochures printed in quantities of 50,000 each, cost an average of 20 and 200 cedis each, respectively, posters average 85 cedis each in quantities of 20,000, and handbooks like the Community Development Worker Health Manual cost approximately 750 cedis each in quantities of 5,000.

Drug manufacturers occasionally mount consumer/public advertising efforts on over-the-counter drug products. These materials must be approved by the Pharmacy Board prior to release.

Pharmacy students at the University of Science and Technology in Kumasi have undertaken community service campaigns directed at appropriate drug use. For example, they have visited homes to collect outdated medicines saved from past treatment periods (eg, liquid antibiotics) and provided the message that such saving of medicines is not a good idea.

Current Human Resources in Public Pharmaceutical Sector

The following table of staffing requirements and current levels was produced by the MoH Personnel Planning Unit, headed by Dr J D Otoo

STAFF CATEGORY	NUMBER APPROVED	NUMBER AT POST	NOTES
PHYSICIANS	709	588	
NURSES/MIDWIVES	15,784	15,347	
MEDICAL ASSISTANTS	407	363	
PHARMACISTS	131	105	
DISPENSING TECHNICIANS	232	148	
DISPENSARY ASSISTANTS		732	
DISPENSARY ATTENDANTS			position phased out
SUPPLY OFFICERS		40	
ACCOUNTS OFFICERS		247	
STOREKEEPERS		266	
ORDERLIES			Variable
DRIVERS			Variable
SECURITY (DAY)		398	
SECURITY (NIGHT)		1,050	

Current staffing found in the regional survey

The current staffing in the five regional stores and twenty facilities surveyed is found in the following table

RPM Ghana Assessment June 1993 (Data from Regional Survey)

Dispensing Workload in 19 Health Facilities, over 20 days

REGION	LEVEL	Workload				Dispensary Staffing				Total		
		Scripts/day	Items/day	Items/Script	Days	Rxists	Disp Tech	Disp Asst	Disp Atten	F T E	Script/Day Per Disp	Drugs/Day F T E
Volta	Ho RH	133	392	3.0	20	4	5	3	6	18	7	22
Volta	Keta DH	87	235	2.7	20	1	1	3	3	8	11	29
Volta	Anloga HC	23	82	3.5	20			1		1	23	82
Volta	Anyako HC	20	61	3.1	20					0	Medical Asst/Nurse dispense	
North	Tamale RH	70	364	5.2	20	3	5	15		23	3	16
North	Bole DH	13	44	3.4	20		2			2	6	22
North	Tuna HP	16	52	3.2	20				1	1	16	52
North	Mole HC	11	39	3.7	20				1	1	11	39
Brong	Sunyani RH	192	408	2.1	20	4	3	9	6	22	9	19
Brong	Goaso DH	69	213	3.1	20	1	1	1	1	4	17	53
Brong	Sankore HC	28	74	2.6	20				1	1	28	74
Brong	Kukuom HC	7	20	2.8	20				1	1	7	20
West	Reg Hosp	65	261	4.0	20	3	4	6	6	19	3	14
West	Tarkwa DH	28	84	3.1	20	1	1	1		3	9	28
West	Nsuaem HC	14	70	4.9	20			2		2	7	35
West	Dompim HP								1	1	No data on dispensing	
Accra	Ridge RH	43	96	2.2	20	3	3	2	3	11	4	9
Accra	Tema DH	155	423	2.2	20	1	1	1	5	8	19	53
Accra	Tema HC	79	245	3.1	20	1		1	4	6	13	41
Accra	Manhean H	42	120	2.9	20				1	1	42	120
Average		19	58	173	3						13	40

In the nineteen facilities which reported prescription data, the workload varied significantly, at least for the periods considered. More staff were available at regional hospitals, with progressive decreases at district hospitals and health centers, while the average work load per full time equivalent was lower at the higher levels, suggesting that some redistribution of staff may be in order. It must be remembered, however, that the 20 day periods were not the same from region to region (due to random selection) and that pharmacists and staff at hospitals have other obligations in addition to dispensing prescriptions.

It should be noted that the average private sector salary for pharmacists is considerably higher than that in the public sector. Reportedly, public sector pharmacists earn about c75,000 (US\$125) per month to start, while in the private sector, salaries start at about c150,000 per month and range up to c300,000 per month. Part time pharmacists in the private sector can earn between c75,000 and c200,000. Obviously there is some incentive for pharmacists to leave the public service, or to double their salary by working part time in the private sector at the expense of their public duties. This is no doubt true for other staff categories as well.

Recommendations for Drug Information and Drug Utilization

1 Drug use review

Given the overuse of drugs in general, and antibiotics and injections in particular, which was identified in the regional survey, great potential for improved use of drugs and significant financial savings exists. Drug use studies should be undertaken to assess the patterns of prescribing and identify areas for possible intervention, stressing effective, safe and cost effective prescribing. The MoH should also study the problem of access to prescription drugs outside of the legally established system and make recommendations for decreasing the likelihood of this occurrence.

The Ghana core group of the International Network for Rational Use of Drugs (INRUD) is based at Korle-Bu Teaching Hospital. INRUD in general and the Ghana INRUD group in particular are very active in assessing drug use patterns and in devising interventions to improve drug prescribing and use. The Ministry of Health should establish active linkages with INRUD to focus attention on drug utilization in MoH facilities.

A joint WHO-INRUD regional workshop on Rational Drug Use is being planned for Accra in the first quarter of 1994, it is recommended that the MoH attempt to find donor support to assure that a cross section of MoH physicians, pharmacists and planners participate in this regional workshop.

2 Drug information center

The MoH should collaborate with the University of Ghana to establish a centralized drug information center that would be staffed specifically to provide referral support to the Ministry of Health, the universities and other training facilities, and health care practitioners. The center should be responsible for providing drug information services to universities, Ministry facilities and health providers, the Pharmacy Board, and to private sector practitioners. The center could also provide services to universities, such as assistance to universities in setting up course work options relating to drug information development, evaluation, and dissemination.

The Ministry should also use the drug information center as a base for drug use review studies and interventions, and to provide training and continuing education programs/workshops for both health care providers and consumers. Programs could focus on drug information, rational drug use and on effective communications techniques.

The drug information center should probably be based at the University of Ghana Medical School in Accra, given the access to the Ministry and to the major concentration of population and health providers.

3 Prescription labelling and patient counselling by pharmacists

The assessment survey found that over 80% of dispensed drugs were not adequately labelled. Proper use of medication by the patient/consumer requires adequate knowledge and understanding of what, why and how it must be taken. Dispenser-consumer interaction time was very short in most of the observed instances, even less than one minute. Time and effort are required to appropriately communicate instructions for proper use.

The MoH should implement norms for proper dispensing procedures (including patient counselling) and labelling of medications. The Ministry should communicate these norms through workshops, seminars, and written notifications, and monitor compliance with regional and district level monitoring.

4 Control of direct sale of prescription drugs

The ability of a consumer to obtain prescription drugs outside of the formal health care system has the potential to cause great harm to individuals, and to society, if micro-organisms become resistant to antibiotics due to widespread overuse by consumers.

The Ministry and the Pharmacy Board should study the problem of direct consumer access to prescription drugs outside of the legally established system and take steps as feasible to eliminate or at least reduce direct sales.

5 Consumer education programs

The Ministry should provide consumer/patient education initiatives relating to pharmaceuticals. These might include public education campaigns focussing on general drug use topics such as

- the importance of knowing the names of the medicines you are taking
- taking prescribed antibiotics until they are finished
- compliance with dosage instructions
- not sharing medicines with others
- proper storage of medicines
- not buying prescription medicines without a prescription
- what kind of questions to ask the physician and pharmacist about the medicines which have been prescribed and dispensed

Public education campaigns might be coordinated with the Health Education Unit of the Ministry of Health (similar to existing campaigns) and the medical and pharmaceutical societies. It is suggested that the Community Development Worker Health Manual should be revised to include sections on general drug use topics.

6 Pharmacy staffing

The MoH and Regional Administrations may wish to use survey data to consider staffing requirements at the various levels of care in these five regions, and once the second Regional Survey is completed, begin to consider what changes may be in order. It would seem that the workload at most of the health centers observed could justify a Dispensary Technician.

2.6 Product Quality Assurance

Quality Assurance in Drug Registration and Procurement

For registration purposes, applications must include a certification of free sale in the country of origin. In addition to authorization for marketing, compliance with Good Manufacturing Practices must be certified. Thus, although it is not clear whether Ghana is a signatory of the WHO Certification Scheme for the Quality of Pharmaceutical Products Moving in International Trade, many of the key elements of the Certification Scheme are fulfilled in the Ghana requirements for registration of pharmaceutical products, the notable exception being the approved indications. On some, but not all 1992 international purchase contracts, WHO Certificates of Good Manufacturing Practice were demanded.

Quality Assurance Reporting System

There is no formal mechanism to allow prescribers, dispensers or the general public to report problems with pharmaceutical products. Spontaneous reports and complaints, particularly from individual patients, have been received by the Pharmacy Board. The results of follow-up on the complaint or report are usually communicated to the person who submitted the report, and to no one else, within a period of one week (seven days).

No register is maintained of these reports. When deemed appropriate, the Pharmacy Board communicates the results confirming defective or substandard products to prescribers, dispensers and the general public through the lay press. No circulars or special mailings are undertaken by either the Pharmacy Board or the Standards Board.

No statistics were readily available on the number of reports submitted on product problems over the past few years. Concern about the quality of pharmaceutical products in this country has been openly expressed by individual prescribers, dispensers, public health authorities, academicians (University medical and pharmacy experts), health professional associations (medical and pharmacy), and the pharmaceutical manufacturers association. This concern is supported by some evidence (tests confirming suspicions of fake or substandard products).

It was the opinion of Pharmacy Board staff that current storage conditions and handling in the Central and Regional Medical Stores and the dispensing practices do not significantly contribute to product deterioration.

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Quality Assurance Monitoring and Testing

In Ghana the Pharmacy Board and the Ghana Standards Board are primarily responsible for monitoring and testing for drug product quality. However, there are now four drug testing laboratories with varying capacity and purpose in Ghana.

Full range of tests	<ul style="list-style-type: none">● Ghana Standards Board● Pharmacy Board● School of Pharmacy, University of Science and Technology
Identification only	<ul style="list-style-type: none">● Customs Laboratory

The Ghana Standards Board still absorbs most of the workload in pharmaceutical product quality testing. It is also the WHO collaborating drug testing laboratory for West Africa, and is the best equipped of the laboratories.

The Pharmacy Board laboratory currently suffers from a lack of modern testing equipment and from a lack of funds to purchase drug reference standards which are required to test pharmaceuticals. This lab completed fewer than ten tests in-house in 1992 (most of the rest were referred to the Ghana Standards Board). New equipment (high-pressure liquid chromatography) is scheduled for installation in the Pharmacy Board facility soon.

Under a recent Government of Ghana/World Bank project, the University of Science and Technology School of Pharmacy received funding to obtain pharmaceutical testing equipment. However, there have been difficulties with the equipment that was purchased (inappropriate for current electrical power in Ghana), and further lengthy delay is inevitable before the equipment can be used. This facility is sometimes used by the Standards Board as an external referee when there is interest in confirming test results or when specific testing cannot be done in-house.

The availability of both standards and reagents is a significant obstacle to quality control testing at both the Ghana Standards Board and the Pharmacy Board laboratories. Standards are usually obtained from the WHO Centre in Sweden. The British Pharmacopoeia is the official pharmacopoeia. The United States Pharmacopoeia is usually not applied.

There is some confusion (and disagreement) over which roles should properly be played by the various public sector laboratories. It is unclear to the assessment team that three major drug testing laboratories are really needed or cost effective, given the high cost of maintaining and replacing equipment and of obtaining reference standards and other supplies.

In the private sector, quality control testing capability exists in three pharmaceutical manufacturing firms: DANAFCO Limited, Sterling Products, and GIHOC Pharmaceuticals Limited. Other pharmaceutical manufacturing firms may contract the services of the Standards Board. Non-governmental organizations such as the Catholic Secretariat have also used the services of the Standards Board to verify the quality of the products that are procured.

The quality of locally manufactured drugs is only tested when there are complaints of product quality. According to the Pharmacy Board staff, substandard drug products due to formulation problems and contamination with fungal growth are the most commonly detected problems with locally manufactured products. Counterfeit and expired drug products constitute the main problems detected with imported pharmaceutical products.

Results of assays of substandard drug products are not compiled or reported for use in public sector tenders or for on-going tracking. The Standards Board reports information on substandard products to the Pharmacy Board. Neither the Pharmacy Board nor the Standards Board are consulted on previous experience regarding the quality of specific products during tender assessment, although in one recent case a tender award was refused because the Pharmacy Board had notified the MoH concerning a quality problem involving the vendor.

The sale of counterfeit pharmaceuticals has been detected by the Pharmacy Board. Some of the fake products include

- Menestrogen tablets and injection
- Primodos tablets
- Fercupar syrup
- Tonovan tablets
- Cumorit tablets and injection

When imported pharmaceutical products arrive at the port of entry, the customs inspectors check the goods against a list of banned drugs issued by the Pharmacy Board and for compliance with the Legislative Instrument 1512, which requires labelling to be in English, and show the expiry date of the product as well as the country of origin. Importation of pharmaceuticals manufactured in the African subregion has been suspended because of justified concern over the introduction of counterfeit pharmaceuticals. There is also a list of banned drugs (see table).

Drugs that are Banned in Ghana

- Phenylbutazone, its salts, derivatives
- Aminopyrine, its salts, aminopyrine sulphonates and their salts
- Iodochlorhydroxyquinoline, derivatives
- Zomepirac sodium
- Methaqualone and its salts
- Secobarbital (Quinalbarbitone)
- All mercury-based soaps

Source: Gazette, 29 December 1989

When there is doubt regarding the identity or the quality of the imported product, a sample is obtained and sent to the "Customs, Excise and Preventive Services Quality Control Laboratory" for testing. This is based primarily on "the customs inspector's experience" regarding product quality. This agency's main concern is to confirm the identity of pharmaceuticals. Although testing for identity of antibiotics and antimalarial drugs is theoretically possible, little or no testing is actually done. A recently detected incident involved mislabelling of phenylbutazone as ferrous sulphate. The identity of the product was established by the Standards Board.

Quality Assurance Inspections

The following table summarizes comparative responsibilities of the two main bodies responsible for drug quality assurance in Ghana

Activity	Pharmacy Board	Standards Board
Inspection		
Chemical production factories	NO	YES
Drug manufacturing plants	YES	YES
Pharmacies	YES	Occasionally
Chemist seller shops	YES	Occasionally
Central Medical Stores	YES	NO
Private health facilities	YES	NO
Number of inspections (1992)		
Drug manufacturing firms	22	No data
Pharmacies	282	No data
Number of samples	35	No data
Method of sampling	Non-random	Non-random
Testing		
Identity	YES	YES
Potency	YES	YES
Stability	Sometimes	YES
In vitro dissolution	YES	YES
Pyrogens	NO	NO*
Number of tests		
Private sector samples	57	No data
Public sector	No data	No data
Lead time	3 - 7 days	14 days

* Pyrogen testing is done by the University of Ghana Noguchi Memorial Institute for Medical Research

Data relate to 1992, as discussed earlier, fewer than ten tests were actually performed by the Pharmacy Board Laboratory, the rest were referred out, primarily to the Ghana Standards Board

Human resources available at the Pharmacy Board and the Standards Board for pharmaceutical quality control are

Resources	Pharmacy Board	Standards Board
Inspectors	5	6
Trained in GMP	2	3
Place of training		
In-house		
Abroad	Senegal Malawi	Belgium
Duration of training	2 weeks (S) 4 weeks (M)	8 weeks
Testing personnel		
Pharmacists	3	3
Technicians	2	2
Scientific officer	0	1

The Pharmacy Board inspectors use the WHO Good Manufacturing Practice (GMP) Guidelines as reference for manufacturing plant inspections. Ghana has not published or adopted its own GMP Guidelines. When inspecting private drug outlets, inspectors check the following items:

- 1 the presence of the pharmacist or in his/her absence the supervisor of the shop,
- 2 the presence of reference books, DDA or prescription book and the recordings in them,
- 3 the quality of drugs on the shelves and presence of fake, spurious or banned drugs and unregistered drugs,
- 4 the sources of drugs (through examination of invoices and way bills),
- 5 the cleanliness of shop, and
- 6 the extent to which the practice in the shop complies with Pharmacy Board regulations with respect to dispensing, extemporaneous preparations, and renewal of licenses

The following table is a summary of Pharmacy Board Inspections in 1992

REGION	PHARMACIES Total Sites	N° VISITED	%
Greater Accra	267	170	64%
Ashanti	98	70	71%
Volta	4	4	100%
Western	11	9	81%
Eastern	10	8	80%
Central	7	7	100%
Northern	5	5	100%
Brong Ahafo	11	9	82%
Upper East	0	0	N/A
Upper West	0	0	N/A
	413	282	68%

There is no information compiled on the number of occasions when violations were reported as a result of Pharmacy Board inspections. The last time major action was taken in relation to violation of regulations following an inspection was in 1989.

Recommendations for Product Quality Assurance

1 Quality assurance problem reporting system

A formal mechanism for reporting pharmaceutical product problems should be developed and implemented. Although spontaneous reporting occurs, it is most likely that many problems either go undetected or not reported. A formal mechanism would greatly favor more reporting and greater likelihood of problem detection. Likewise, an appropriate method of feedback, other than verbal notification or publication in the lay press should be established.

2 Register of manufacturer performance

Better access is needed to information on past performance of manufacturers and on the quality of pharmaceuticals procured by the Ministry of Health and/or those available in the private sector, this is impeded by the lack of a public record of product problems either reported or detected through product testing.

The Pharmacy Board and MoH should establish a system to record and report on the results of product quality testing for use in assessing Ministry of Health tenders. The results confirming substandard products should be routinely communicated to Ministry of Health (procurement department), or both the Pharmacy Board and the Standards Board should be consulted when assessing tenders.

3. Clarification of roles of quality assurance laboratories

Roles of the various quality assurance laboratories in Ghana should be clarified, consideration should be given to limiting the proliferation of laboratories, because of the difficulty in obtaining standards and proper equipment and supplies.

The number of tests that have been performed, particularly at the Pharmacy Board Quality Control Laboratory is still quite low. This may be attributed to difficulty in obtaining standards and reagents, lack of equipment to conduct some of the tests (for example, high pressure liquid chromatography).

In light of difficulties in ensuring timely supply of standards and reagents for product quality testing, the Pharmacy Board should avail itself of simple tools, such as requesting certificates of assay for each batch imported or manufactured locally. Locally, this would stimulate greater use of testing capabilities, particularly at the Standards Board.

4 Use of WHO Certification Scheme

For registration purposes, the Pharmacy Board should formally join the WHO Certification Scheme for Pharmaceutical Products Moving in International Trade (if it is not already a member). The Ministry of Health and Ghana Supply Commission should use the current Certification Scheme guidelines in specifying quality assurance standards and in requesting certifications from suppliers and exporting country regulatory agencies. This would provide some assurance that the specific product manufacture complies with Good Manufacturing Practice Guidelines.

2.7 Private Sector Pharmaceutical Activity

Availability of Physicians and Pharmacists

There are about 1200 doctors in the country with about 800 in the public sector. There are about 700 pharmacists in the country. About 100 are employed in the public sector. The remainder are in the private sector as retailers, wholesalers, industrial pharmacists, detail persons, and university teachers. There are 413 licensed pharmacy shops in the country, along with 4037 registered Chemical Sellers.

Officially, pharmacists working in the public sector cannot own a private drugstore or work in a private drugstore. In practice, however, this does occur. Similarly, physicians in the public sector cannot own or operate a private practice but this does occur.

Pharmaceutical Manufacturing and Importation

No multinational pharmaceutical company has an office or plant in Ghana. These companies are represented by individual detail men working alone or with a local pharmaceutical company. Local companies produce mainly generic items. Prominent local manufacturers include GIHOC Pharmaceuticals, DANAFCO, Phemeco, Letap Pharmaceuticals, J. L. Morrison Son & Jones, and Sterling Products.

As an example, the production capacity of GIHOC Pharmaceuticals Limited is 1.2 billion tablets or capsules per year. It is a state-owned manufacturer which supplies chemical sellers, pharmacies, private hospitals and clinics, and the Ministry of Health facilities.

YEAR	Volume of Sales (Cedis)
1988	518,000,000
1989	828,000,000
1990	852,000,000
1991	993,000,000
1992	942,000,000

Source: GIHOC Pharmaceuticals, 1993

At one time, the government actively encouraged local manufacturing. Some manufacturers feel that the support is less obvious now. For example, some of the local manufacturers interviewed complained that MoH tenders were adjudicated solely on the basis of the most favorable price offered, regardless of the source, and that locals cannot compete on the ICB tenders. It should be noted, however, that MoH does do separate tenders, one of which is reserved entirely for local manufacturers. Also, the government makes it very difficult to import finished products that are manufactured locally and are on the national Essential Drugs List, such as paracetamol, aspirin, tetracycline, ampicillin and multivitamins. Reportedly private importers have difficulty getting an import license for these sorts of drugs even if the local manufacturers are having trouble supplying one of the drugs.

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Constraints on local manufacturing include competition with imported products, which tend to be cheaper. Local manufacturers have to pay a 10% duty on raw materials in addition to paying excise duty. Coupled with the high cost of production, locally manufactured products tend to be more expensive than imported ones.

Local pharmaceutical manufacturers receive no preferential treatment for financial assistance, paying the same interest rates on bank loans as other businesses. Although the government limited the importation of certain finished drug products to protect the local market, the manufacturers as a group have not been able to consistently supply all products which are restricted, and in some cases these drugs are smuggled into the country.

The percentage of private sector drugs supplied by local firms is estimated by one source to be about 25% by value. It has been claimed that with its current manufacturing capacity the private sector could supply 60-70% of the public sector drugs by value.

Before 1988, the Ministry of Health and the government hospitals and clinics accounted for approximately 90% of GIHOC's sales. After 1988, the Ministry of Health went to open tender. Since then, GIHOC sales to the Ministry of Health constitute only 50%, 40%, and 20% of this firm's sales.

No information could be obtained as to the total volume of private sector sales, either at the wholesale or retail level. As noted in the indicators discussion in Section I, UNIDO estimated the 1990 total public and private pharmaceutical expenditures at US\$10.00 per capita in Ghana. The total declared value of pharmaceuticals manufactured in Ghana was 9 billion Cedis in 1992, according to the Ghana Customs department.

The Customs department was also able to provide the assessment team with the declared value of 1992 imported drugs, it is shown in the following table, taken together, imports and manufactured drugs had a declared value of about US\$18 million (or about \$1.20 per capita).

It is likely that declared value is not always full value, so this total may be somewhat understated. It is interesting to note that the duty does not seem to be a flat 10% according to these figures (or 20% for analgesics and antimalarials). The average duty for all categories was 8.9%, with a range of 2% to 15% (which was analgesics/antimalarials).

Ghana RPM Assessment

DECLARED VALUE OF PHARMACEUTICAL IMPORTS AND MANUFACTURING - 1992

DRUG CATEGORY	CIF VALUE (Cedis)	DUTY (Cedis)	DUTY %
IMPORTS			
Vaccines for human medicine	72,673,763	1,548,437	2.1%
Medicines of Penicillin or Streptomycin	14,945,318	1,122,100	7.5%
Medicines of other antibiotics	135,347,885	8,334,120	6.2%
Medicines of other hormones	146,410,703	8,358,183	5.7%
Medicines of alkaloids and other derivatives	1,232,388	47,369	3.8%
Other medicines with 2 or more constituents	415,232,758	27,682,653	6.7%
Antimalarials and analgesics	294,093,661	44,412,204	15.1%
Chemical contraceptive preparations (hormones and spermicides)	596,863,496	57,483,158	9.6%
Totals (Cedis)	1,676,799,972	148,988,224	8.9%
US\$ Equivalent (600-1)	\$2,794,667	\$248,314	
MANUFACTURING			
	9,000,000,000		
US\$ Equivalent (600-1)	\$15,000,000		

Importation of pharmaceutical products requires a permit from the MoH. The usual lead time is about a week, although we heard complaints of delays. Present trade liberalization policies has removed foreign exchange restrictions. Credit facilities may also be used to purchase raw materials or finished products depending on agreement reached between the local company and the overseas principal. The credit facility may be granted for between 30 and 90 days. Access to foreign currency may be strained as a result of shortages in the forex bureaus.

GIHOC Pharmaceuticals Limited, although a state-owned institution, receives no special access to foreign exchange. When the funds are available, it takes from two to four weeks to get foreign exchange from the Bank of Ghana. DANAFCO reported that they have no problems with access to foreign exchange, but they use the private foreign exchange market.

Private Sector Pricing and Price Controls

Currently, there are no price controls on pharmaceutical products. The usual markup at wholesale level is 20-33.3% on landed cost. Depending on exchange rate fluctuations and market forces, this may range between 25% and 50%. Purchases funded through bank loans tend to have higher rates as a result of the current interest rate of between 34% and 36%.

The usual retail markup is reported to be between 20% and 25%. Retailers may put as low as 10% to 15% markup on fast-moving items.

According to policy, the custom duties on imported drugs is the same for both the public and the private sectors (10%). There is an additional 10% protective importation duty on analgesics and antimalarial drugs, which are manufactured in Ghana.

Private Sector Promotion and Marketing

The total number of medical representatives from the private sector in the country is not known. Sales representatives of local manufacturers tend not to do promotional work to prescribers, but instead act as salespeople to the private drug outlets. Representatives of multinational and other foreign companies, however, do a lot of promotional work on both public and private practice physicians. They also carry out similar activities directed at both public and private sector pharmacists.

Local manufacturers and multinationals provide funds to support scientific activities organized by the pharmacy and medical associations, the Ministry of Health, and for community development. Support may be in the form of donation of products or cash awards. The level and extent of the support depends on the financial state of the particular company. There has been a lull in these activities lately as a result of poor business. These contributions have also been extended to public and private sector physician participation in scientific activities outside the country. These contributions are usually provided through the various societies and institutions, and not directly to the individual.

Some firms, like Oyster Healthcare Limited and DANAFCO, have also provided support for pharmacy and medical students to attend scientific activities in the country, and have undertaken community-oriented activities as well. DANAFCO and Glaxo Ltd. actively support the Ghana Diabetic Association and the Asthma Society respectively.

Currently there is no attempt by the government to control or modify marketing of pharmaceuticals.

Potential For Private Sector Cooperation with MoH Logistics System

The Ministry of Health does not contract with private pharmacies or NGOs to provide prescription, storage and/or distribution services, although the MoH does provide budgetary support for the Christian Health Association of Ghana. The NGO infrastructure now plays a significant role in serving areas where no public sector system exists.

Most of the private sector pharmaceutical institutions interviewed felt that storage and distribution of public sector pharmaceutical could be supported by, or provided entirely by, private sector vendors (or NGOs). Public sector direct service delivery (prescriptions) and purchasing may be difficult to support by the private sector. The following companies were cited as being capable of supporting some of the logistical activities:

<u>Firm or NGO</u>	<u>Potential Service</u>
DANAFCO Limited	Storage and distribution
GIHOC Pharmaceuticals	Packaging, storage and distribution
Pharco	Storage
J L Morrison	Storage and distribution

The team visited DANAFCO, where Mr I K Williams explained that the company has a country-wide distribution system, with eight regional depots. DANAFCO has acted as a distributor for the Ghana Social Marketing Program for several years, though reportedly there have been mixed results.

Many private sector pharmacists belong to Ghana Cooperative Pharmaceuticals Ltd, which is a cooperative which purchases pharmaceuticals in bulk and distributes at reasonable cost to the members, who are also the shareholders. The distribution of the membership is shown in the table below:

<u>REGION</u>	<u>PHARMACIES</u>
Greater Accra	90
Ashanti	20
Eastern	5
Western	5
Central	5
Volta	3
Northern	2
Brong-Ahafo	1

This cooperative warehouse operates in essence as a central medical stores for pharmacies, the Ghana Cooperative might be a useful collaborator in helping the Ministry of Health determine the future structure of the Ministry of Health system.

Recommendations for Private Sector Pharmaceutical System

1 It is recommended that MoH actively investigate the possibilities for private sector assistance to the MoH logistics system, details are discussed in the recommendations for the study on options for decentralization and privatization (see 2 1 E)

ANNEXES

Annex I List of Acronyms

List of Acronyms

AID	Agency for International Development
AIDS	Acquired Immunodeficiency Syndrome
ARI	Acute Respiratory Infection
<u>BNF</u>	<u>British National Formulary</u>
C&C	Cash & Carry
CDO	Civil Defense Organization
CD ROM	Compact Disc Read Only Memory
CEPS	Customs, Excise and Preventive Service
CHAG	Christian Health Association of Ghana
CIDA	Canadian International Development Agency
CMS	Central Medical Stores
DAP	Drug Action Programme
DEM	Drug Estimation Module (MSH-developed software)
EEC	European Economic Community
EDL	Essential Drugs List
FDA	Food and Drug Administration
FP	Family Planning
FPLM	Family Planning Logistics Management
GMP	Good Manufacturing Practice
GSC	Government Supply Commission
INN	International Non-proprietary Name
INRUD	International Network for Rational Use of Drugs
INVEC	MSH-developed inventory control software
ITC	International Trade Centre
LAC/HNS	Latin American Caribbean/Health, Nutrition and Sustainability (AID contract)
MCH	Maternal and Child Health
<u>MIMS</u>	<u>Index of Medical Specialties available in Africa, produced by IMS</u>
MIS	Management Information Systems
MoH	Ministry of Health
MSH	Management Sciences for Health
NF	National Formulary
ODA	Overseas Development Agency
PAHO	Pan-American Health Organization
PDR	Physicians' Desk Reference
PHC	Primary Health Care
QA	Quality Assurance
R & D Health	Research & Development (AID bureau)
RMS	Regional Medical Stores
RPM	Rational Pharmaceutical Management Project
SIV	Store Issue Voucher
SHS	Strengthening Health Services
STD	Sexually Transmitted Disease
TA	Technical Assistance
UNFPA	United Nations Family Planning Agency
UNIPAC	United Nations International Procurement Agency
USAID	United States Agency for International Development

USP	United States Pharmacopeial Convention
USP DI	United States Pharmacopeial Convention Drug Information (data base)
VEN	Vital, Essential, Necessary (a method of prioritizing drugs)
WB	World Bank
WHO	World Health Organization

Annex II Documents Reviewed

Documents Reviewed

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Annex III Persons Met

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Persons Met

Ghana Ministry of Health

Central MoH

Dr M E K Adibo, Director of Medical Services
Dr A Asamoah-Baah, Director of Planning
Dr A Issaka-Tinorgah, External Aid Coordinator
Colonel P K Awuku, Director of Supply and Procurement
Mr S Botchway, Acting Director of Pharmaceutical Services
Dr J D Otoo, Director of Human Resources, Development and Management
Dr Sam Adjei, Director of Health Research Unit

Central Medical Stores

Mr S Boateng, CMS Pharmacist
Mr J B Annaan, CMS Pharmacist
Mr I A Laryea, Storekeeper assistant
Mr K Agbodza, Clearing officer

Regional Cash and Carry Programme Coordination

Mr Issac Adams (Greater Accra)
Mr Dan Morton (Brong Ahafo)
Mr S Tabiri-Asamoah (Northern)
Mr J Harruna Ahmed (Northern)
Mr H Tayviah (Volta)
Mr Dan Braimah (Western)

Ghana Pharmacy Board

Mr Theophilus Corquaye, Registrar
Mr G K Acheampong, Deputy Registrar (Administration)
Mr G K Awuku-Kwatia, Deputy Registrar (Technical)

Medical and Dental Council

Dr S Adu-Aryee, Registrar

Ghana Supply Commission

Mr B Asante, Executive Director

Ghana Standards Board

Mr N L Hesse, Pharmaceutical Section
Mr J Amartey, Pharmaceutical Section

Customs, Excise, and Preventive Service (CEPS)

Mr E F Sackey, Research and Monitoring Unit
Dr H A Brown-Acquaye, CEPS Quality Control Laboratory
Mr Klutse Evans, Customs Branch

Ministry of Finance and Economic Planning

Mr M A Quist-Therson, Director of the Population Policy Project
Mr G H Attu, Acting Executive Director of the Ghana National Family Planning Project

University of Science and Technology, Kumasi

Professor K Sarpong, Dean of the Faculty of Pharmacy
Professor K Boakye-Yiadom, President, Pharmaceutical Society of Ghana

USAID and USAID Consultants

Dr Pamela Wolf, Technical Advisor
Dr Benedicta Ababio, HPN Officer
Mr Lawrence Aduonum-Darko, HPN Officer
Mr Tim Rosche, Consultant, Family Planning Logistics Management Project
Mr Don Dickerson, Director, Ghana Family Planning and Health Project

Other Donors and Agencies

Dr Marinus Gotink, PHC/EPI Project Officer, UNICEF
Dr Catriona Waddington, HPN Field Manager, British Overseas Development Administration
Mr Nicholas Bennett, World Bank Resident Representative

Ghana Private Sector

Mr Kwabena Ohene-Manu, Managing Director, Oyster Health Care Limited
Mr I K Williams, General Manager, DANAFCO Pharmaceutical
Mr Sesseh, Director, Ghana Pharmacists' Cooperative
Mr David Anim-Addo, Pharmaceutical Society of Ghana
Mr Martin Lassen, DANAFCO Pharmaceutical
Mr Kenneth Adhe Fordjour, Commercial Manager, GIHOC Pharmaceuticals Ltd
Mr Emmanuel Asare, Chief Accountant, GIHOC Pharmaceutical Ltd

Annex IV Central and Regional Survey Data Collection Forms

Available upon Request